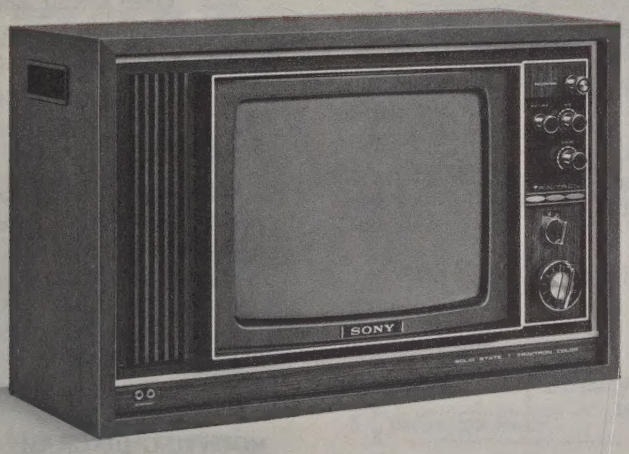
COLOR TV
KV-1220U

Set using ISO screws

Chassis No. up to SCC-A04-D

This manual provides service information for all chassis used in KV-1220U model.



SPECIFICATIONS

TV-signal standards:	American TV standards (NTSC color)
Picture tube:	12" 90° deflection TRINITRON system
Semiconductors and tubes:	53 transistors, 43 diodes and 1 tube
Channel coverage:	VHF; ch. 2 – 13 UHF; ch. 14 – 83
Antenna input impedance:	300 ohms balanced (VHF); dipole antenna and external antenna 300 ohms balanced (UHF); loop antenna and external antenna
IF circuit:	3 stages with 1 double tuned and 3 single tuned elements
Intermediate frequency:	Picture i-f carrier : 45.75 MHz Color sub-carrier : 42.17 MHz Sound i-f carrier : 41.25 MHz
Sound system:	4.5 MHz intercarrier system Power output: 1 watt Harmonic distortion: less than 10% Speaker: $3\frac{3}{16}$" x $6\frac{5}{16}$", 16 ohm voice coil
Convergence correction system:	Horizontal: electrostatic deflection system Vertical: electromagnetic deflection system
Automatic controls:	ACC (Automatic color control) ACK (Automatic color killer) ADG (Automatic degaussing) ABL (Automatic brightness limiter) AVR (Automatic voltage regulator) Pulse-operated agc Forward agc Balanced diode afc
Power requirements:	AC 117V 60 Hz
Power consumption:	AC 98 watts (maximum)
Dimensions:	$20\frac{5}{16}$" (W) x $13\frac{3}{16}$" (H) x $15\frac{7}{16}$" (D)
Weight:	37 lb 8 oz

Note: Chassis No. is labeled on the upper side of rear supporting plate.

SONY®

SERVICE MANUAL

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Chassis No.	SCC-10-A	SCC-A04-BA	SCC-A04-CA	SCC-A04-C	SCC-A04-D
Serial No.	~ 20,000	~ 30,000	~ 34,000	~ 38,000	

SECTION 1
GENERAL INFORMATION AND CIRCUIT FEATURES

1-1. PREFACE

The all-channel 12-inch color television receiver, KV-1220U, employes an entirely new concept in color image production ..... the TRINITRON system. It has a single electron gun in comparison to conventional color picture tubes that have three electron guns. The three beams from the TRINITRON gun are converged and focussed by a unique set of electron lenses and a pair of electron prisms. This system does not require the complicated convergence yoke and multiple difficult adjustments found in conjunction with conventional color television receivers. In addition, the TRINITRON system produces better beam focus to ensure brighter and sharper color pictures with excellent color fidelity.

A new color-selection mechanism, called the Aperture Grille, has been especially developed by SONY, to improve brightness and color fidelity.

TRINITRON System Features:

1. Brighter and sharper pictures with excellent contrast
2. Simple adjustments with no convergence yoke and simplified circuits
3. Low deflection power-requirements and transistorized circuitry makes power consumption low

Additional Features:

Accurate fine tuning adjustments are extremely important in optimum color TV reception. The sky-tuning system gives the viewer a very simple indication of the correct fine-tuning setting.
When fine tuning knob or uhf tuning knob is touched a "blue veil" appears at the top of the screen. The fine tuning knob or uhf tuning knob is then adjusted to make the blue veil on the screen as narrow as possible.
Pre-heat system ..... The set operates perfectly about 5 second after the power switch was ON.
Pre-set fine tuning system ..... After initial fine tuning adjustments have been made, it will not be necessary to readjust fine-tuning after changing channels.

1-2. GENERAL INFORMATION

The KV-1220U has five printed circuit boards, one TI (tuning indicator) block and one high-voltage block.

As viewed from the front, the CD (chroma-deflection) board is located at the left side, the S (signal) board is at the bottom, the P (power-supply) board is at the rear, the T (socket) board is on the base of the picture tube and the A (audio) board is at the right side.

The TI (tuning indicator) block is located at the bottom of the chassis, and the high-voltage block is mounted at the right side of the chassis.

The speaker is located at the left side of the front panel, and vhf and uhf tuners are located at the right side of the front panel.

Components mounted on the picture tube, starting at the socket and working forward, are as follows:

1. beam alignment magnet assembly
2. convergence anode cap
3. convergence alignment magnet
4. purity magnet assembly
5. deflection yoke
6. magnetic shield
7. picture-tube degaussing coil

The anode button at the top-center of the picture tube provides high voltage (21 kV at zero beam current) for the tube. Another anode-type connector is located on the neck of the picture tube to provide connection to the convergence plates.

1-3. COLOR DEMODULATOR CIRCUIT

The balanced-type diode and the transistor matrix demodulator systems are employed in the color demodulator circuit shown in Fig. 1-1. The feature of this type circuit is that there is no crosstalk between signals since respective color-difference signals are demodulated in separate circuits.

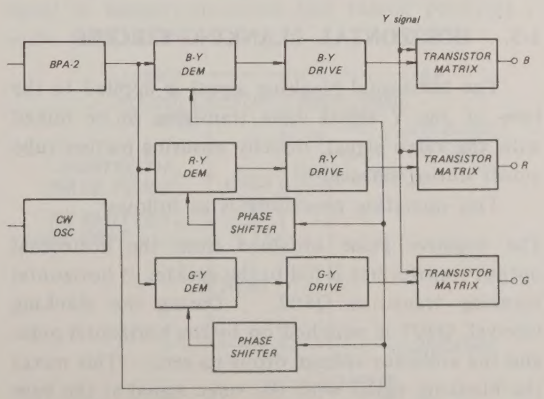


Fig. 1-1. Three-demodulator system used in the KV-1220U

The color-difference signals and the luminance signals are individually applied to the emitters and bases of the respective transistors of the transistor matrix. Therefore, the primary colors, RED, BLUE and GREEN are produced at the collectors of the respective transistor matrix section.

The phase shifters inserted in this circuit are composed of resistors and capacitors. Therefore, no adjustments are required.

1-4. ABL (AUTOMATIC BRIGHTNESS LIMITER) CIRCUIT

The ABL circuit is employed to maintain the beam current of the picture tube within limits, thereby protecting both the picture tube and the high-voltage transformer from possible damage.

The operation of the feedback loop shown in Fig. 1-2 is as follows:

An increase in the beam current of picture tube lowers the emitter voltage of ABL Q408 transistor. As the result, the collector current of Q408 will increase. Thus the base voltage of the Y drive transistor Q409 drops to make the cathode voltage of the picture tube rise.

As the result, beam current tends to decrease toward the original value. In this way the picture tube and the high voltage transformer are protected.

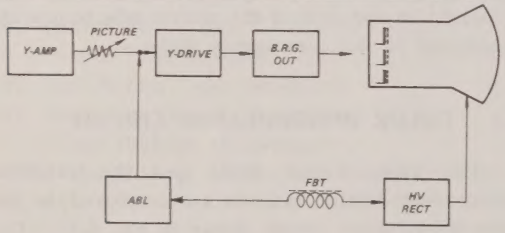


Fig. 1-2. ABL system in the KV-1220U

1-5. HORIZONTAL BLANKING CIRCUIT

The horizontal blanking signal is applied to the base of the Y signal drive transistor to be mixed with the video signal, thereby ensuring picture tube cutoff during retrace.

This operating procedure is as follows:

The negative pulse obtained from the horizontal output transformer is fed to the emitter of horizontal blanking transistor Q407. During the blanking interval, Q407 is switched on by the horizontal pulse and the collector voltage drops to zero. This mixes the blanking signal with the video signal at the base of the Y drive transistor.

1-6. COLOR SYNCHRONIZING CIRCUIT (See Fig. 1-3.)

1. This circuit employs an injection-locked oscillator system for color synchronization. Separated horizontal sync signal is resonated in coil (L307) and capacitor (C384). The pulse that results from the shock-excited tank circuit is employed as a burst gating pulse. Therefore, this circuit is not affected by 3.58 MHz color signals or noise pulses that occur between horizontal sync pulses.

2. Gated burst pulses are converted to a 3.58 MHz continuous-wave signal at the crystal filter. This continuous-wave signal is transmitted to the oscillator for color synchronization purposes. This system provides more stable operation than directly-synchronized crystal oscillators.

3. Since the gating pulses are not obtained from the horizontal output stage, time lags in deflection do not affect gate timing. Therefore, the setting of the horizontal hold control has no effect whatever on the phase of the local 3.58 MHz oscillator or the hues of reproduced colors.

4. The continuous-wave oscillator is an LC oscillator circuit. The continuous-wave amplifier is provided for stable color synchronization and to act as a buffer stage to avoid oscillator-frequency errors caused by turning the hue control.

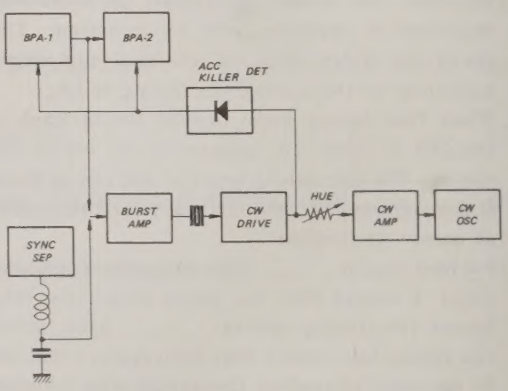


Fig. 1-3. Color synchronizing system used in the KV-1220U

1-7. SKY-TUNING CIRCUIT DESCRIPTION

The sky-tuning indicator section consists of five circuits; a 45.75 MHz narrow-band amplifier circuit, a gate circuit, the touch-switch circuit, a gate switch circuit and the blue-veil indicator circuit. This block diagram is shown in Fig. 1-4. The operation of each circuit is as follows:

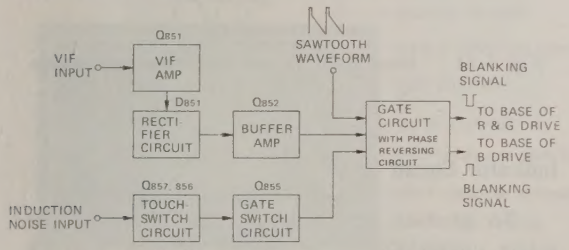


Fig. 1-4. Sky-tuning system in the KV-1220U

45.75 MHz Narrow-Band Amplifier Circuit

The circuit shown in Fig. 1-5 consists of a narrow band amplifier tuned to 45.75 MHz, a detector and a dc buffer amplifier. The purpose of this circuit is to provide minimum dc output when fine tuning is correct. A slight deviation from correct tuning results in an increase in dc output.

Input from the i-f system is amplified by Q851 whose load is tuned to 45.75 MHz by T851. Thus, when the set is tuned correctly, and the picture carrier is converted to exactly 45.75 MHz, the rf output at the secondary of T851 is maximum. An error in fine tuning will shift picture and sound carriers as shown in Fig. 1-6. The resulting change in signal amplitude at the output of T851 is shown by Fig. 1-7.

The detector diode D851 rectifies the 45.75 MHz signal to develop a negative dc voltage labeled Ed in Fig. 1-5. This voltage subtracts from the positive bias voltage developed across R858 (Eo). As a result, the total voltage (E) applied to the base of Q852 is a positive bias that decreases to a minimum value at the correct tuning point (when the picture carrier is precisely 45.75 MHz). Q852 is a buffer to drive the gate circuit.

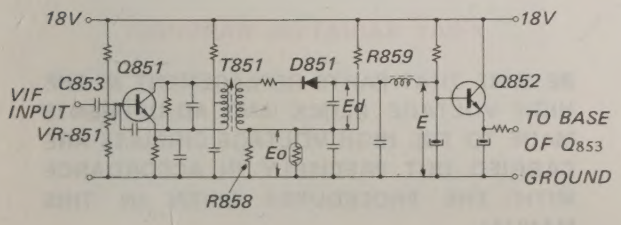
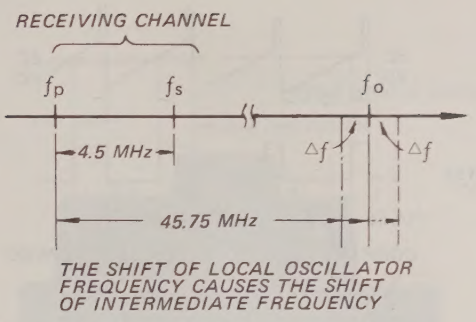


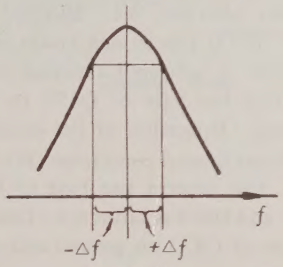
Fig. 1-5. Schematic diagram of sky-tuning system



THE SHIFT OF LOCAL OSCILLATOR FREQUENCY CAUSES THE SHIFT OF INTERMEDIATE FREQUENCY

fp : VIDEO CARRIER
fs : SOUND CARRIER
fo : LOCAL OSCILLATOR FREQUENCY
Δf : SHIFT OF LOCAL OSCILLATOR FREQUENCY

Fig. 1-6. Shifted picture and sound carriers



THE SHIFT OF LOCAL OSCILLATOR FREQUENCY CAUSES A LOWERING OF OUTPUT LEVEL

Fig. 1-7. Tuning curve of T851

Gate Circuit

The gate circuit shown in Fig. 1-8 has three signals applied at the base: the dc control voltage from Q852, a sawtooth waveform from the vertical deflection circuit and a dc turn-on voltage from the touch-switch circuits. A change in the dc control voltage changes the conduction period of Q853 as shown in Fig. 1-9. Thus, when fine tuning is adjusted correctly the pulse width of the collector current signal is narrow; incorrect fine tuning produces a wider pulse width.

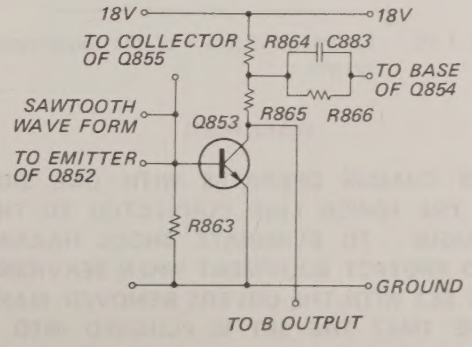
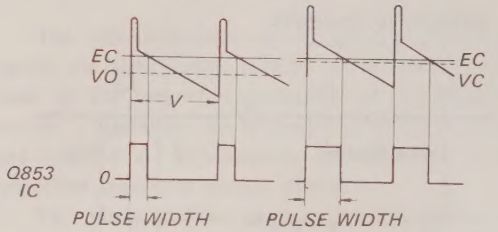


Fig. 1-8 Schematic diagram of gate system



EC: CUTOFF VOLTAGE OF Q853
VO: THE MEAN VOLTAGE AT THE BASE OF Q853

Fig. 1-9.

Touch-switch Circuit

This circuit activates the "blue-veil" indicator when the uhf or vhf fine tuning knobs are touched. When the circuit is activated a virtual short circuit is removed from the base of Q853 to permit the gating operation. Operation of the circuit is shown in Fig.1-10. Under normal conditions Q857 and Q856 are cut off. This returns the base of Q855 to B- through R871 and Q855 is saturated. This effectively shorts the base of Q853 to ground and disables the blue-veil system.

When the fine tuning knobs are touched, stray pick-up signals are applied through C869 to the base of Q857. Rectification in the base of Q857 results in the base voltage shown in Fig. 1-11. Thus, Q857 conducts on the peaks of the input signal. As a result, a dc voltage is developed across C867 that turns on Q856. This, in turn, shorts the base of Q855 to ground and Q855 turns off. This effectively removes the short from the base of Q853 and the blue-veil circuit is permitted to operate.

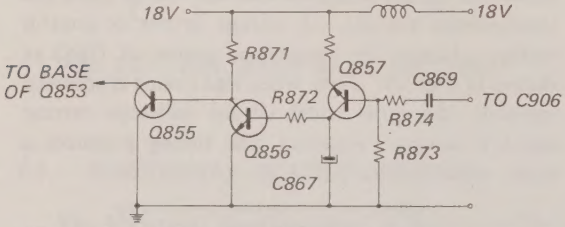


Fig. 1-10. Schematic diagram of the touch-switch system

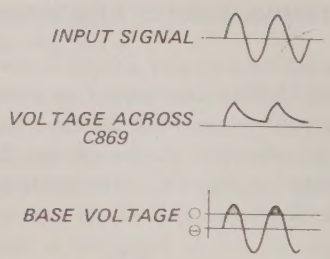


Fig. 1-11. Waveform at the touch-switch system

Indicator Circuit

To produce the blue-veil, the output of the gating circuit Q853, is applied through isolating diodes to the bases of Q402 and Q403 (R-Y and G-Y drive). This blanks the red and green rasters for the duration of the pulse. At the same time an inverted pulse is applied to the B-Y driver to turn on the blue raster. See Fig. 1-12. This produces the bright blue band at the top of the picture. See Fig. 1-13.

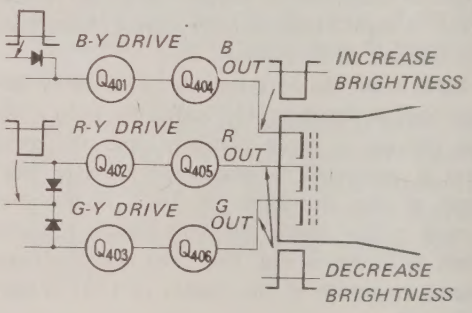


Fig. 1-12. Block diagram blue-veil display

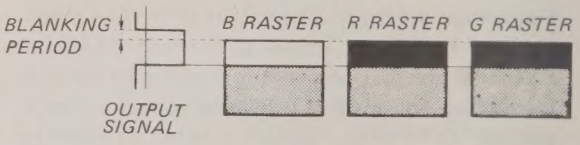


Fig. 1-13. Blue raster display

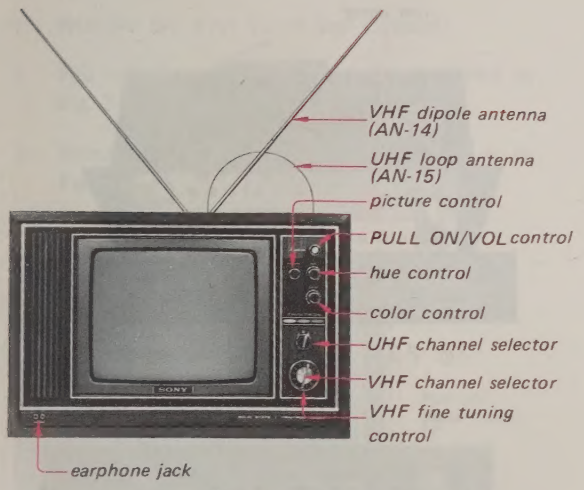
WARNING!!

THIS CHASSIS OPERATES WITH ONE SIDE OF THE POWER LINE CONNECTED TO THE CHASSIS. TO ELIMINATE SHOCK HAZARD AND PROTECT EQUIPMENT WHEN SERVICING THE SET WITH THE COVERS REMOVED, MAKE SURE THAT THE SET IS PLUGGED INTO A SUITABLY-RATED ISOLATION TRANSFORMER.

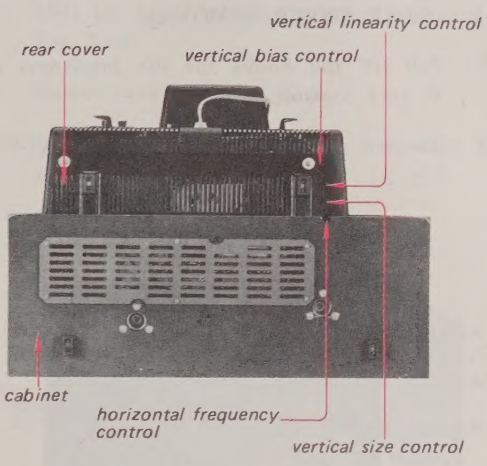
X-RAY RADIATION WARNING!!

BE SURE THAT PARTS REPLACEMENT IN THE HIGH VOLTAGE BLOCK AND ADJUSTMENTS MADE TO THE HIGH VOLTAGE CIRCUITS ARE CARRIED OUT PRECISELY IN ACCORDANCE WITH THE PROCEDURES GIVEN IN THIS MANUAL.

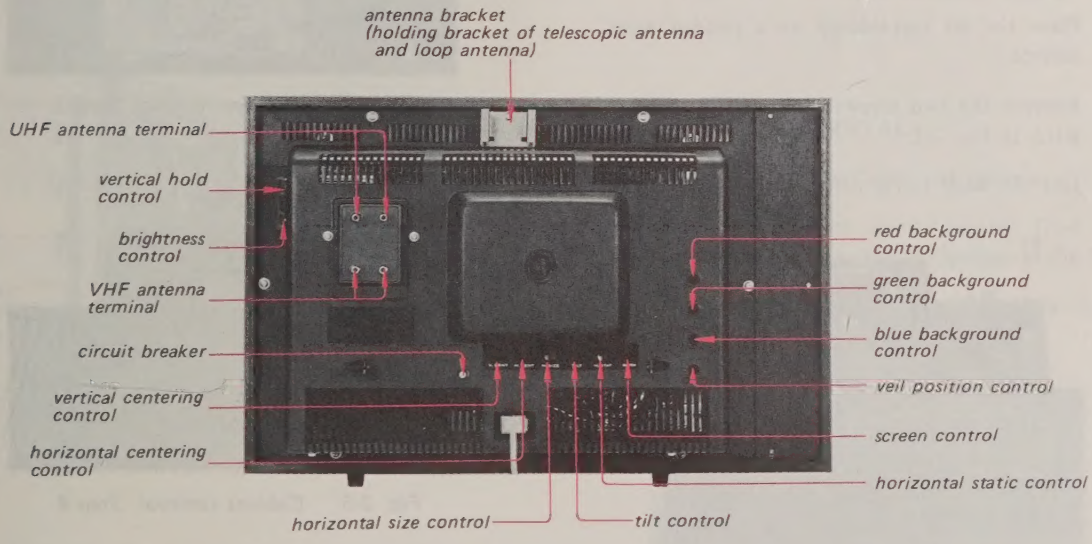
EXTERNAL VIEW



Front View



Bottom View



Rear View

SECTION 2
DISASSEMBLY

2-1. REAR COVER REMOVAL

1. Pull off the knobs for the brightness and V. hold controls.
2. Remove the nine screws labeled A1-9 in Fig. 2-1.

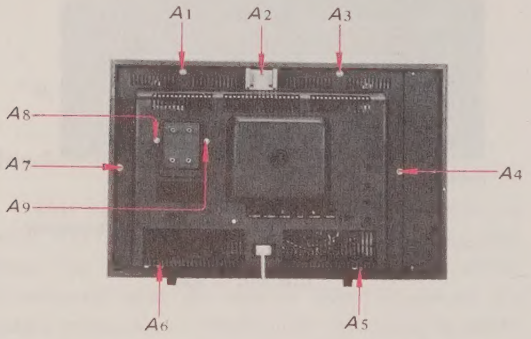


Fig. 2-1. Rear cover removal, Step 2

3. Place the set rear-side-up on a padded work surface.
4. Remove the two screws at the bottom labeled B1-2 in Fig. 2-2.
5. Lift the Rear Cover off as shown in Fig. 2-3.

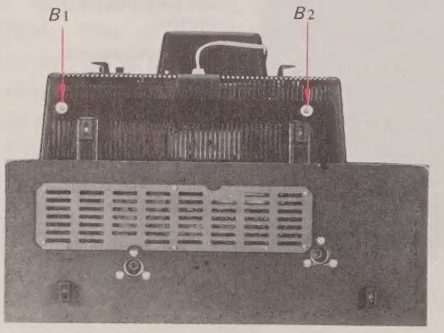


Fig. 2-2. Rear cover removal, Step 4

2-2. CABINET REMOVAL

1. Remove the Rear Cover.
2. Place the set rear-side-up on a padded work surface.
3. Remove the two screws labeled C1-2 in Fig. 2-4.
4. Remove the two screws labeled D1-2 in Fig. 2-5.
5. Lift the Cabinet out as shown in Fig. 2-6.

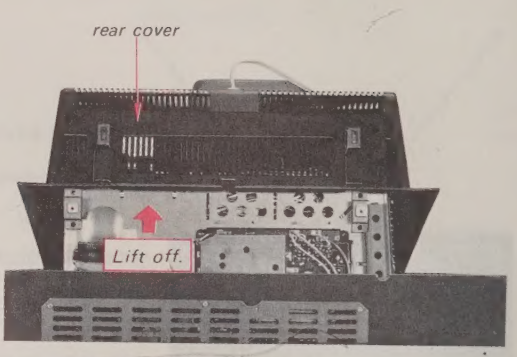


Fig. 2-3. Rear cover removal, Step 5

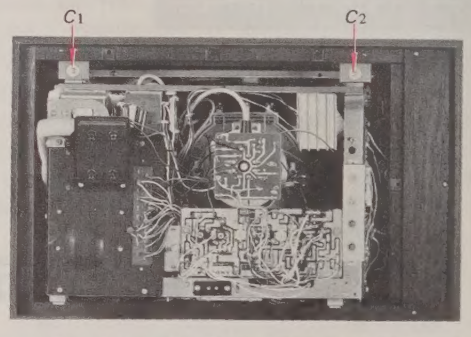


Fig. 2-4. Cabinet removal, Step 3

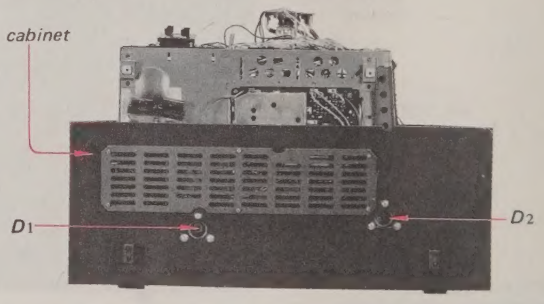


Fig. 2-5. Cabinet removal, Step 4

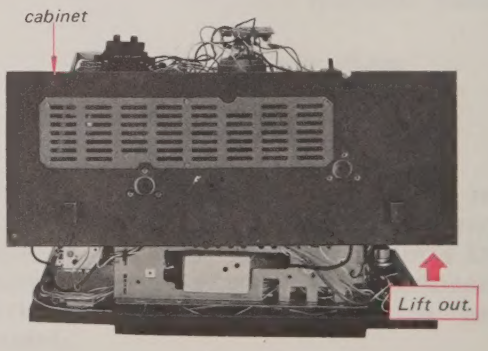


Fig. 2-6 Cabinet removal, Step 5

2-3. CONTROLS REMOVAL

1. Remove the Rear Cover and Cabinet.
2. Pull off four front-panel knobs as shown in Fig. 2-7.
3. Remove the four screws labeled E1-4 in Fig. 2-8.

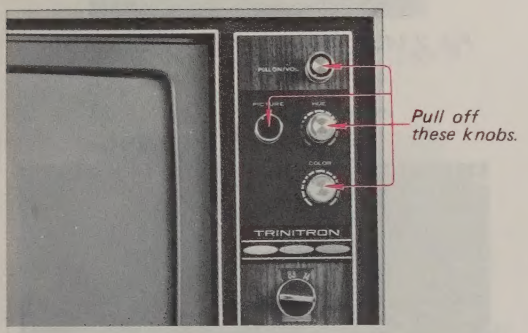


Fig. 2-7. Front-panel control removal

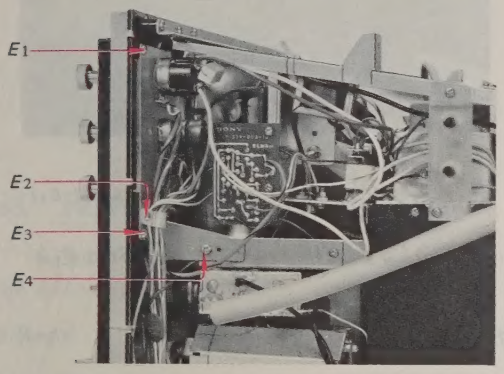


Fig. 2-8. Controls removal, Step 3

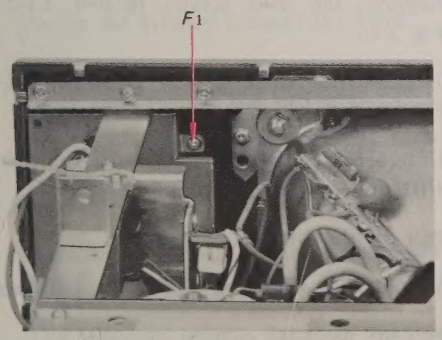


Fig. 2-9. Controls removal Step 4

4. Remove a screw labeled F1 in Fig. 2-9.
5. Melt the point with soldering iron shown in Fig. 2-10.
6. Remove the insulating plate.
7. Replace the controls (volume, hue, color and picture).

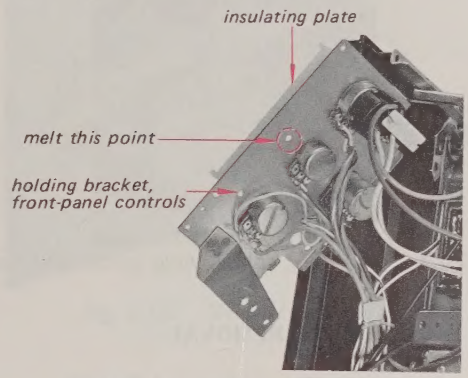


Fig. 2-10. Controls removal, Step 5

2-4. SPEAKER REMOVAL

1. Remove the Rear Cover and Cabinet.
2. Remove the four screws labeled G1-4 and loosen the holding plate for speaker in Fig. 2-11.
3. Unsolder the two lead wires and then change the speaker.

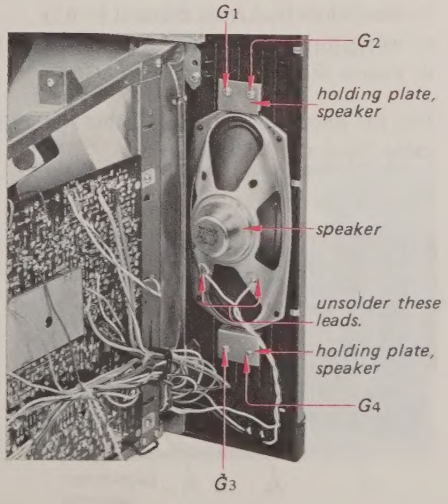


Fig. 2-11. Speaker removal, Step 2

2-5. BRIGHTNESS AND V. HOLD CONTROLS REMOVAL

1. Remove the Rear Cover and Cabinet.
2. Remove the two screws labeled H1-2 in Fig. 2-12.
3. Replace the controls.

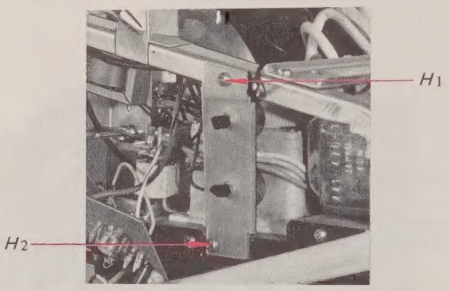


Fig. 2-12. Brightness and V. hold controls removal

2-6. VHF TUNER REMOVAL

1. Remove the Rear Cover and Cabinet.
2. Pull off the VHF Channel selector knob and the Fine tuning knob.
3. Remove the three screws labeled J1-3 in Fig. 2-13.
4. Remove the three screws labeled K1-3 in Fig. 2-14.
5. Pull out the VHF tuner slowly.
6. Unsolder the following leads at the VHF tuner. (See Fig. 2-15.)
   a. white/red lead to UHF tuner (switch)
   b. blue/white lead from S board (+ B2)
   c. white/brown lead from S board (+ B1)
   d. yellow lead from S board (AGC)
7. Pull the phono plug, UHF-IF cable and VHF-IF cable from the VHF tuner.
8. Remove the VHF tuner.

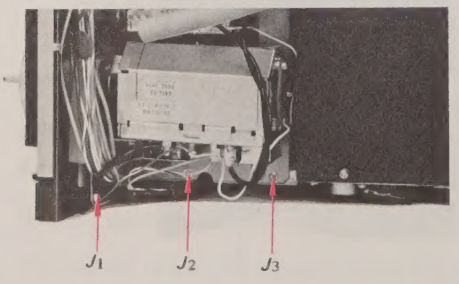


Fig. 2-13. VHF tuner removal, Step 3

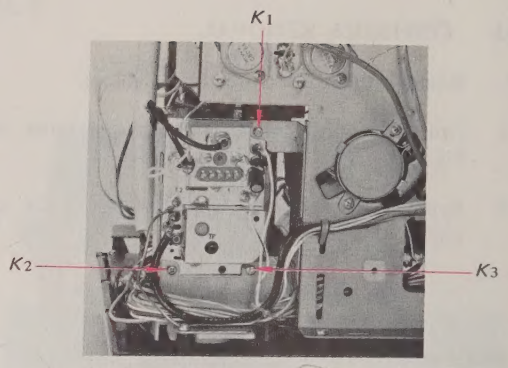


Fig. 2-14. VHF tuner removal, Step 4

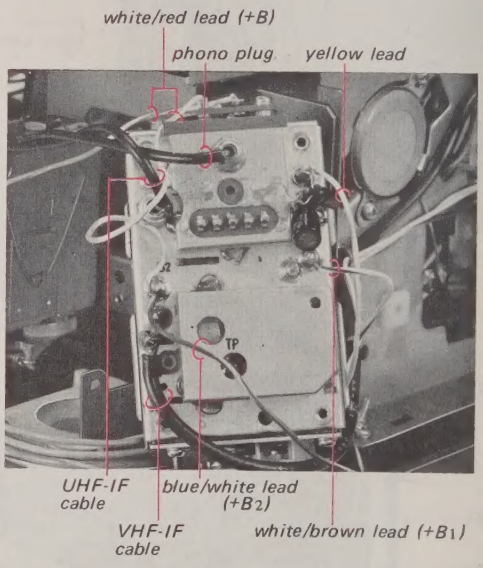


Fig. 2-15. VHF tuner removal, Step 6

2-7. UHF TUNER REMOVAL

1. Pull off the UHF Channel selector knob.
2. Perform steps 1 – 5 in Procedure 2-6.
3. Remove the two screws labeled L1-2 in Fig. 2-16.
4. Remove the three screws labeled M1-3 in Fig. 2-17.
5. Unsolder the UHF antenna feeder cable from UHF tuner.
6. Pull off the UHF-IF phono plug.
7. Unsolder the white/red lead at the UHF tuner.
8. Pull off the UHF channel indicator.
9. Remove the UHF tuner.

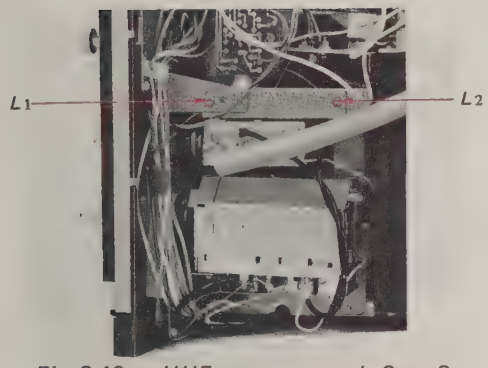


Fig. 2-16. UHF tuner removal, Step 3

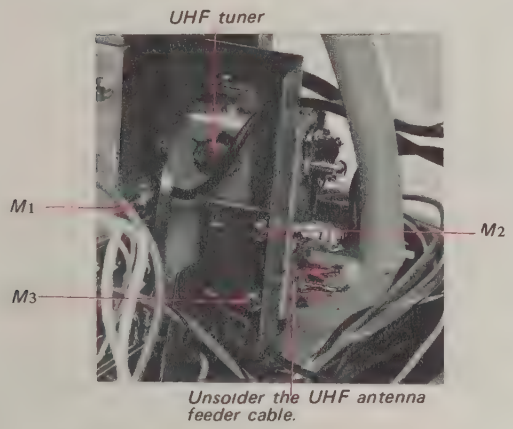


Fig. 2-17. UHF tuner removal, Step 4

2-8. PRINTED CIRCUIT BOARD REMOVAL

Remove the Rear Cover and Cabinet to perform the following:

S Board

1. Place the set front-side-down.
2. Remove the two screws labeled N1-2 in Fig. 2-18.
3. Swing the S board towards the front.
4. If it is necessary to remove the board altogether, remove the two screws that secure the plastic hinges to the chassis.

CD Board

1. Remove the two screws labeled P1-2 in Fig. 2-19.
2. Pull off the three pin-plugs that connect between the red, blue and green outputs of CD board and the T board. (See Fig. 2-20.)

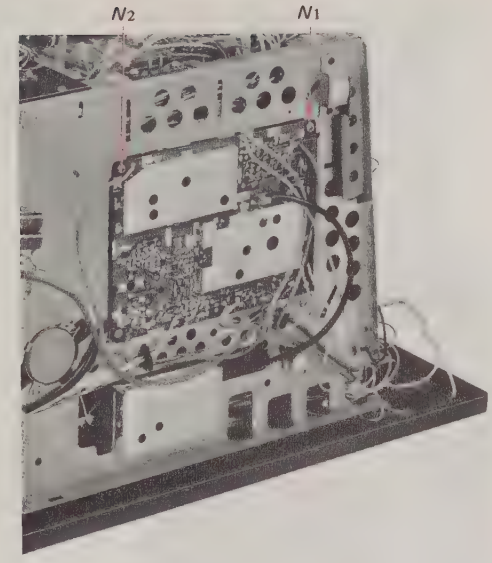


Fig. 2-18. S-board removal

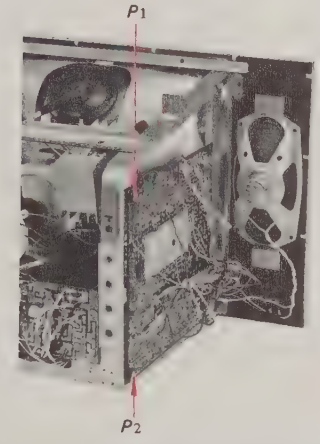


Fig. 2-19. CD-board removal

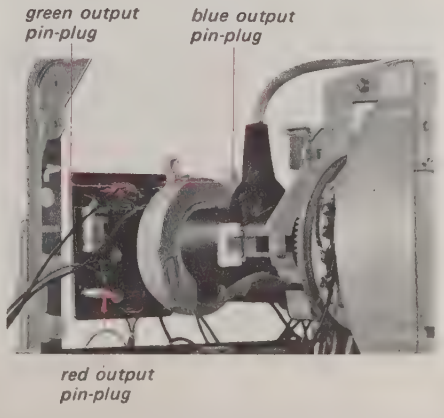


Fig. 2-20. Removal of cathode-drive leads

3. Swing the CD board to the front as shown in Fig. 2-21.

4. If it is necessary to remove the board altogether, remove two screws that secure the plastic hinges to the chassis.

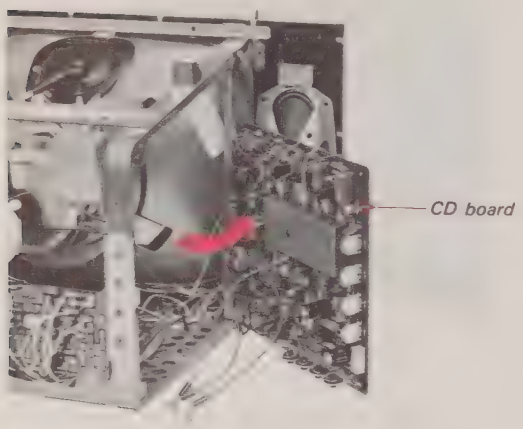


Fig. 2-21. CD-board swung out for access to components

P Board

1. Remove the two screws labeled Q1-2 in Fig. 2-22.

2. Swing the top edge of the P board down until the board rests in a horizontal position as shown in Fig. 2-23.

3. If it is necessary to remove the board altogether, remove the two screws that secure the plastic hinges to the chassis.

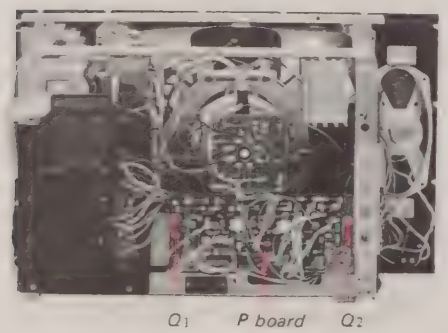


Fig. 2-22. P-board removal

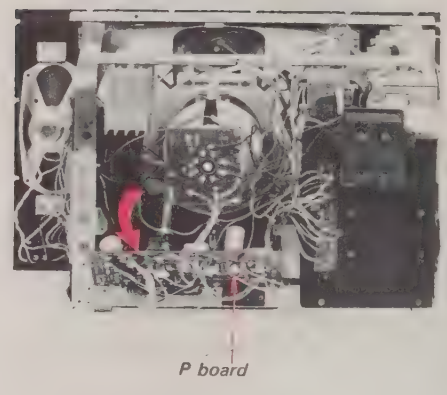


Fig. 2-23. P-board position for component access

A Board

1. Remove the two screws labeled R1-2 in Fig. 2-24.

2. Unsolder the leads that are connected to the A board.

3. Remove the A board.

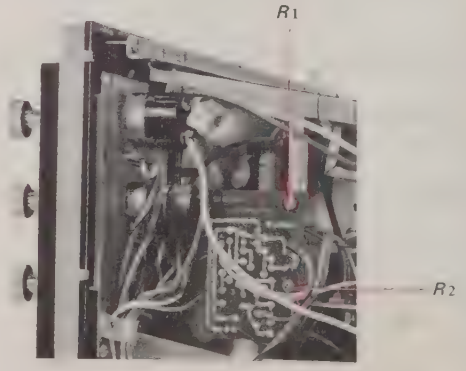


Fig. 2-24. A-board removal

TI Board

1. Remove the two screws labeled S1-2 in Fig. 2-25.

2. Pull out the TI board slowly.

3. Take off the upper and lower shielded case.

4. Remove the TI board.

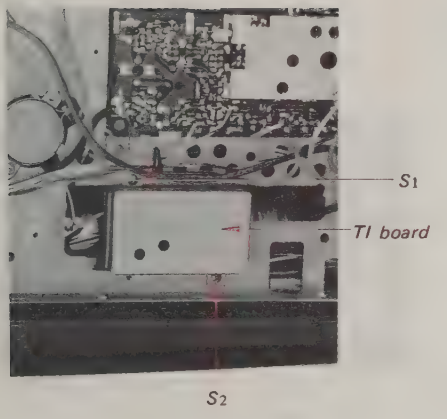


Fig. 2-25 TI board removal

2-9. PICTURE TUBE REMOVAL

1. Remove the Rear Cover and Cabinet.
2. Pull off the four control knobs on the front panel.
3. Pull off the VHF Channel Selector and Fine tuning konbs, and UHF Channel Selector knob.
4. Unsolder three leads (two red and a purple) that are connected to the 6-pin terminal board. See Fig. 2-26.

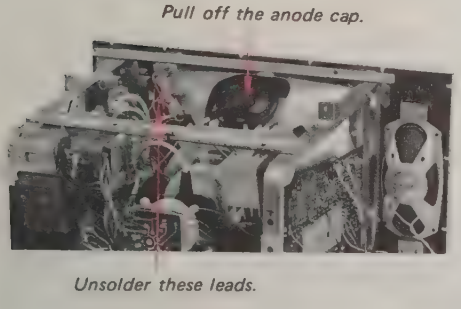


Fig. 2-26 Picture-tube removal, Step 4

5. Remove the CD board.
6. Unsolder three leads (yellow, green and blue) that are located at the left of the deflection yoke. See Fig. 2-27.

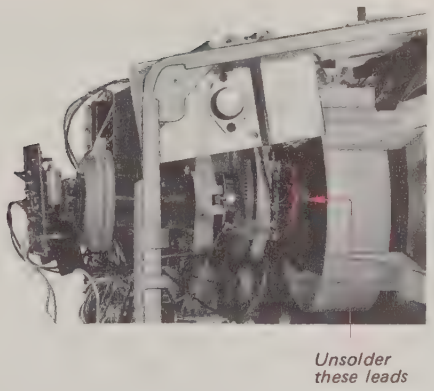


Fig. 2-27. Picture-tube removal, Step 6

7. Pull off the T (socket) board from the picture tube.
8. Pull off two anode caps, convergence anode cap and HV anode cap, from the picture tube. Remove the convergence anode cap by removing the screws and lifting the flaps on each side of the picture tube neck. Do not pull the anode cap straight back towards the base of the tube.
9. Remove the beam alignment magnet assembly by loosening the clamp as shown in Fig. 2-28.
10. Unsolder four leads (two yellow, a green and a red) that are located at the right of the deflection yoke.
11. Place the set rear-side-up on a padded work surface.

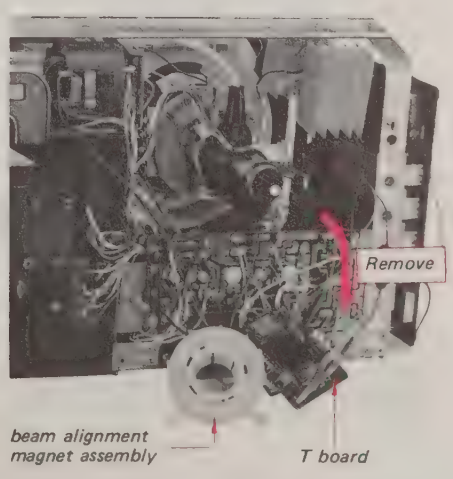


Fig. 2-28. Picture-tube removal, Step 9

12. Unsolder the black lead that is connected to the bottom of the chassis. See Fig. 2-29.

13. Remove the eleven screws labeled T1-11 in Fig. 2-29.

14. Lift off the chassis from the picture tube.

15. Remove the four nuts labeled U1-4 in Fig. 2-30.

16. Remove two wing screws and loosen the clamp band of the deflection yoke as shown in Fig. 2-31.

17. Pull out the picture tube from the front panel and then remove the shield cover from the picture tube.

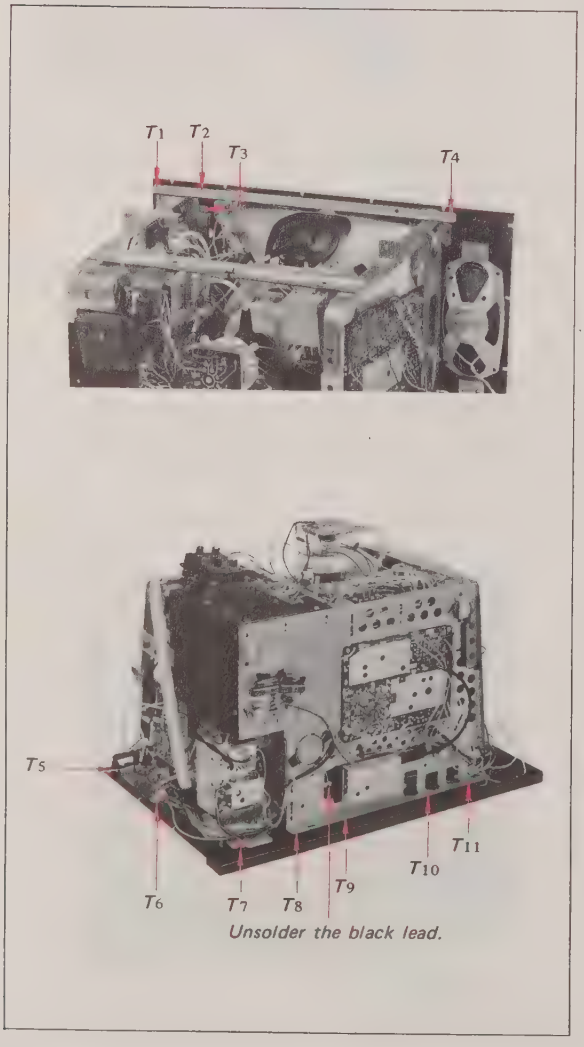


Fig. 2-29. Picture-tube removal, Steps 12 and 13

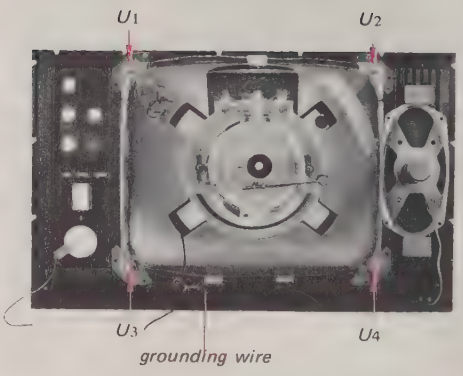


Fig. 2-30. Picture-tube removal, Step 15

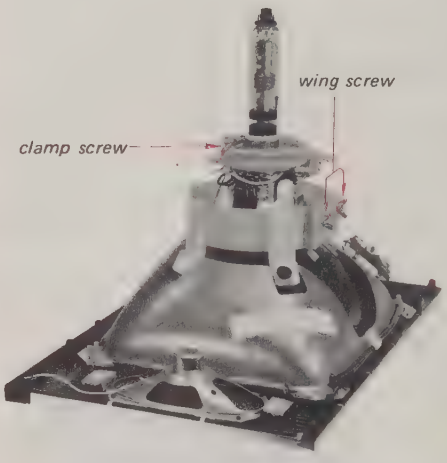


Fig. 2-31. Deflection-yoke removal

Note: The plastic assembly that supports the deflection yoke is permanently affixed to the bell of the picture tube. Do not try to pry the plastic assembly off the picture tube. Replacement picture tubes come with the yoke mount attached.

2-10. NEW PICTURE TUBE INSTALLATION

1. Place the shield cover on the new picture tube and then insert the tube into the front panel.
2. Tighten the four nuts shown in Fig. 2-30.
3. Insert the picture tube into the set. Install and tighten the eleven screws shown in Fig.2-29.
4. Solder the all leads to their original tie points. (Reverse Steps 4, 5, 6, 10 and 12 in procedure 2-10.)
5. Install the beam alignment magnet assembly and position the center of the two-terminal group at the 12 o'clock position. Set the rear edge of the beam alignment magnet assembly to contact with the convergence anode cap.
6. Install the two anode caps. Insert and tighten two bolts on the convergence anode cap.
7. Install the picture tube socket (T) board on the base of the tube.

2-11. HORIZONTAL OUTPUT TRANSFORMER AND FLYBACK (CONVERTER) TRANSFORMER REPLACEMENT

1. Remove the Rear Cover and Cabinet.
2. Remove the antenna terminal board.
3. Move the two caps (on the lid of insulating case) along the leads to the anode caps. (See Fig. 2-32.)
4. Remove the four screws labeled V1-4 in Fig. 2-32.
5. Swing the cover of insulator case as shown in Fig. 2-33. This permits access to the components of the convergence circuit and the socket of the rectifier tube.

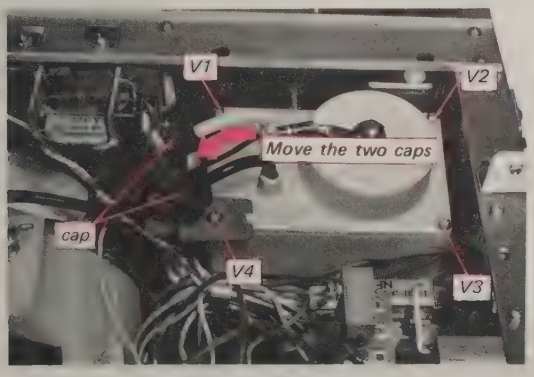


Fig. 2-32. High-voltage insulator case removal

6. Remove the four screws labeled W1-4 in Fig. 2-34.
7. Swing the cover of high voltage cage down as shown in Fig. 2-35.

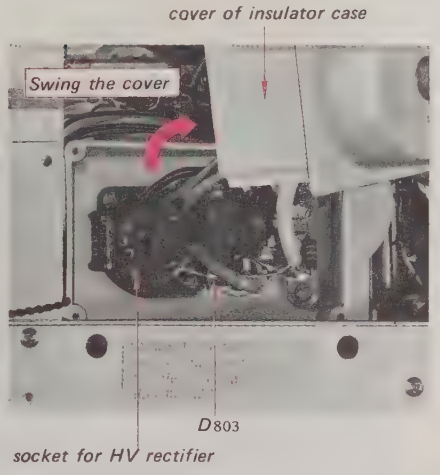


Fig. 2-33. Removal of the cover of high-voltage insulator case

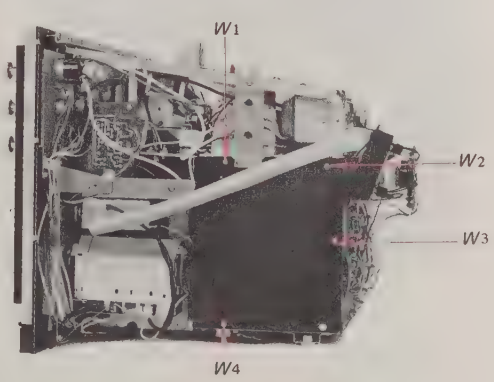


Fig. 2-34. High-voltage cage removal, Step 6

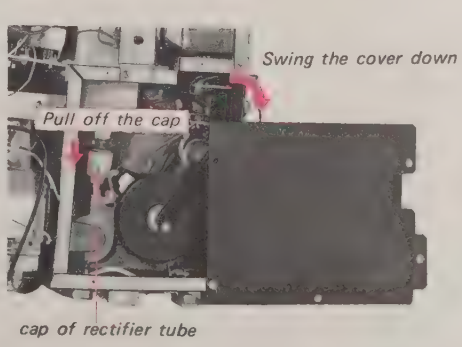


Fig.2-35. Removal of the lid of high-voltage cage

8. Pull off the cap of the rectifier tube.

9. Remove the six screws labeled X1-6 in Fig. 2-36.

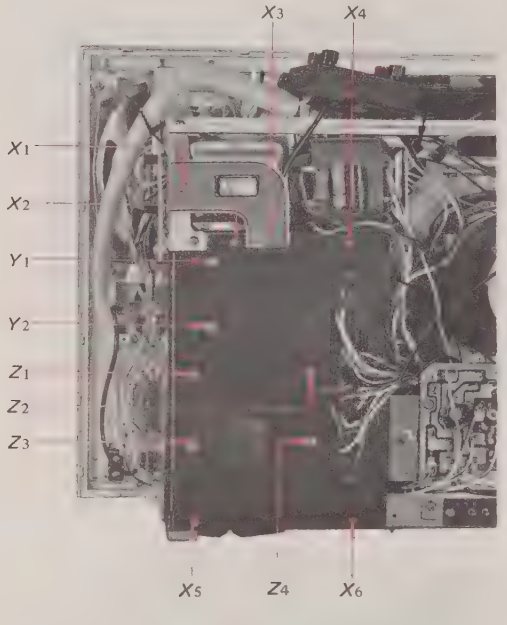


Fig. 2-36. Screws for removal of the rear cover, horizontal output transformer and flyback transformer

10. Pull out the rear of high voltage cage by pulling out the power transformer. See Fig. 2-37.

11. Remove the two screws labeled Y1-2 in Fig. 2-36.

12. Replace the horizontal output transformer.

13. Remove the four screws labeled Z1-4 in Fig. 2-36.

14. Replace the flyback transformer.

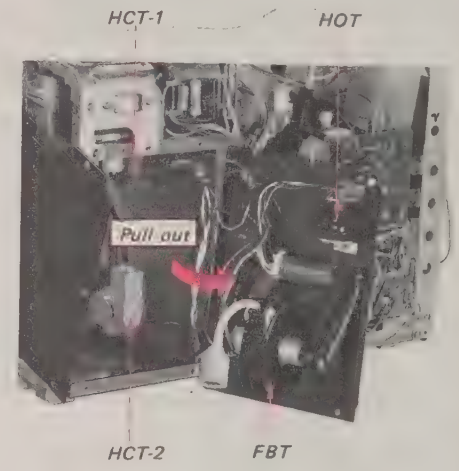


Fig. 2-37. Cage disassembled for access to the flyback and horizontal output transformer

SECTION 3
SERVICE ADJUSTMENTS

3-1. BEAM LANDING ADJUSTMENTS

Beam landing adjustments are made to ensure correct landing of the three beams on their designated phosphor stripes. Incorrect beam landing at any point on the screen results in color contamination (a predominant hue) in those particular areas of the screen. Also, this adjustment is used when a complete realignment is needed following picture tube replacement.

Preparation:

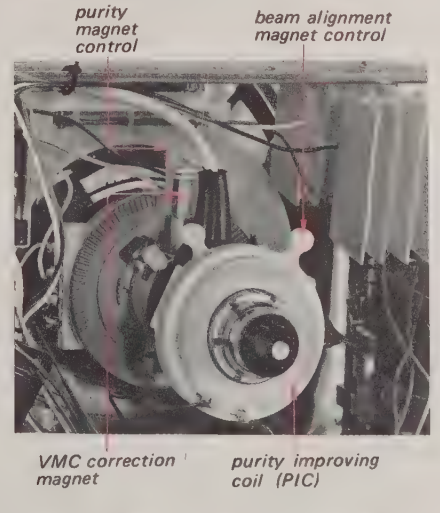
1. Receive the dot pattern from the color-bar generator.
2. Set the horizontal and vertical hold control for correct sync.
3. Set the contrast control and the brightness control fully clockwise.

Adjustment Procedure:

1. Face the screen due east or west.
2. Degauss the entire screen area several times using a degaussing coil.
3. If misconvergence appears on the screen, adjust the horizontal static control (H-STAT) for best convergence at the center of the screen.
4. Set the purity magnet control shown in Fig. 3-1 (align the two plastic sector gears) to obtain the minimum magnetic field.
5. Loosen the mounting screws that secure the deflection yoke. Slide the deflection yoke forward against the funnel of picture tube.
6. Remove the red and blue leads on the T board to display a green raster. The screen should appear as shown in Fig. 3-2.
7. Adjust the purity magnet control to center the vertical green band on the screen. See Fig. 3-3.
8. Slide the deflection yoke back towards the tube base to obtain a uniform green over the entire screen.
9. If small areas of mislanding are found, make touch-up adjustments with the purity magnet.
10. Push the connectors of the red and blue leads onto the T board to produce a white raster.
11. If mislanding is still found, touch-up the purity magnet and the position of the deflection yoke.
12. If mislanding is found at the extreme corners of the screen, correct it by positioning small disc magnets at the edges of the screen. Secure these magnets with double-sided pressure sensitive tape.

    Note: If these magnets are secured at the edges of the screen, confirm that no mislanding is present on the screen by degaussing the entire screen area several times.

13. Degauss the set using a degaussing coil, then confirm that no mislanding is present on the screen.



Beam Alignment Magnet Assembly is composed of a beam alignment magnet and purity improving coil (PIC).

Fig. 3-1. Purity-magnet tab setting for minimum field

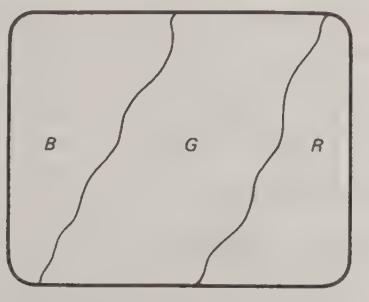


Fig. 3-2. Yoke too far forward

3-2. CONVERGENCE ADJUSTMENTS

The following should be completed before starting the convergence adjustments.

a. Horizontal and vertical width and linearity adjustments.

b. Landing adjustments.

c. Pincushion correction.

d. Focus adjustments.

Confirm that mislanding does not appear on the screen after static and dynamic convergence adjustments are made. If necessary, repeat the landing adjustment procedure.

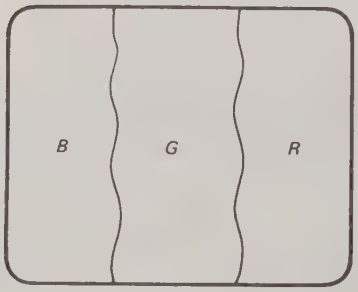


Fig. 3-3. Correct setting of purity-magnet

Preparation:

1. Receive the dot pattern from the color-bar generator.
2. Face the set due east or west.
3. Set the horizontal and vertical hold controls for correct sync.
4. Set the brightness control at midrange and the picture control fully counterclockwise.
5. Degauss the entire screen area several times using a degaussing coil.

Adjustment Procedure:

Horizontal static convergence

1. Adjust the horizontal static convergence control to converge the red dots and the blue dots with the green dots at the center of the screen. See Fig. 3-4.
2. If the blue dot does not converge with the green and red dots at the center of the screen, adjust the horizontal magnetic convergence control (HMC) as necessary. See Fig. 3-5 and Fig. 3-6.

Note: 1) If adjustment of the horizontal magnetic convergence is needed to correct convergence, mislanding may appear on the screen. Therefore, repeat the landing-adjustment procedure.

2) In most cases adjustment of the HMC control will not be needed.

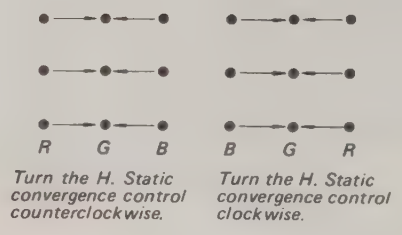


Fig. 3-4. Horizontal static convergence adjustments

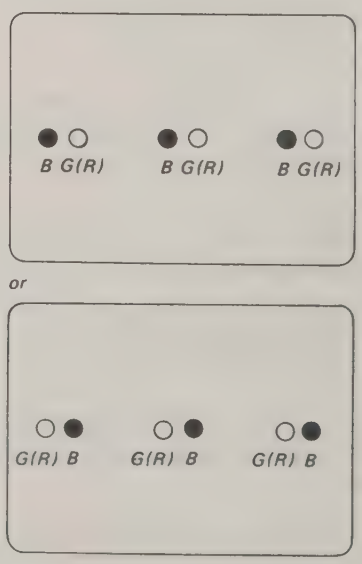


Fig. 3-5. Horizontal magnetic convergence (HMC) control adjustment

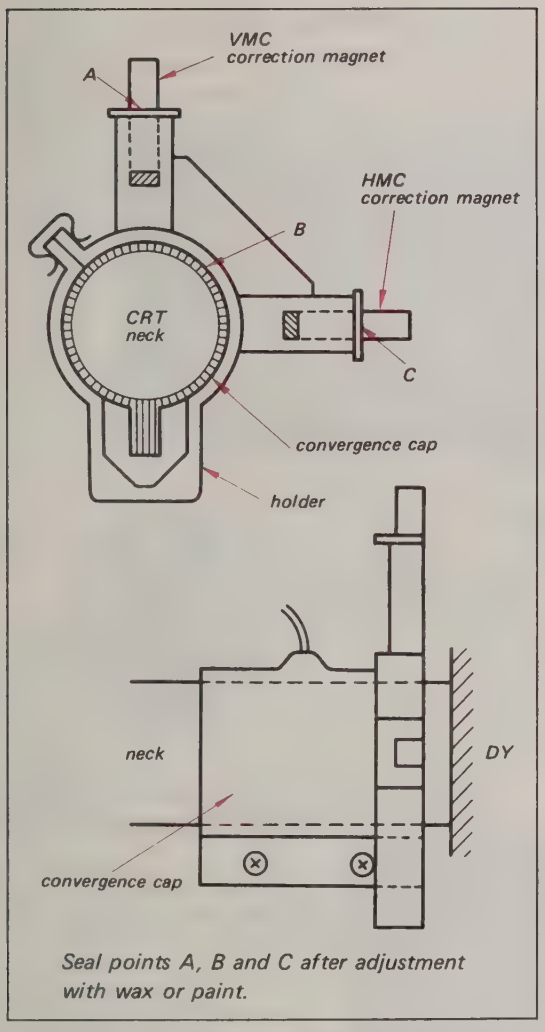


Fig. 3-6. Holder for HMC and VMC, and setting position

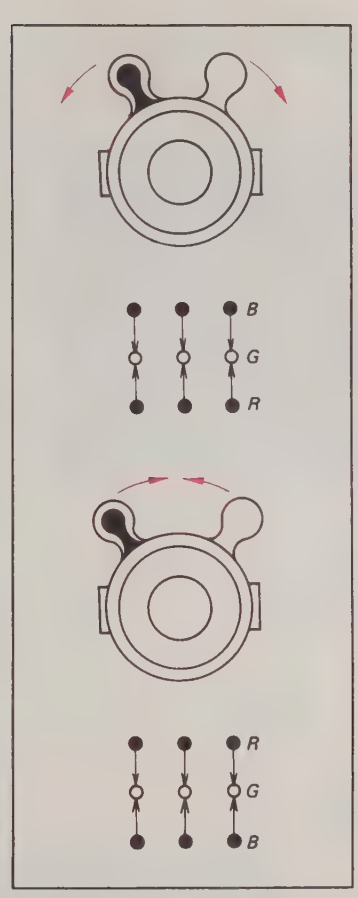


Fig. 3-7. Action of the beam alignment magnet

Vertical static convergence

1. Spread the two tabs of beam alignment magnet in equal amounts opposite directions to converge red dots and blue dots with green dots. See Fig. 3-7.

2. If the blue dot does not converge with the green and red dots at the center of the screen, adjust the vertical magnetic convergence (VMC) control as necessary. See Fig. 3-8.

Note: 1) If it is necessary to correct convergence by using the VMC control, mislanding may appear on the screen. Therefore, repeat the landing-adjustment procedure.

2) In most cases adjustment of the VMC control will not be needed.

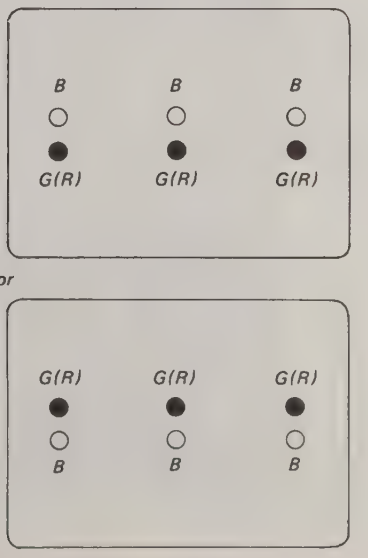


Fig. 3-8. Vertical magnetic convergence (VMC) control adjustment

Horizontal dynamic convergence adjustment

Horizontal dynamic convergence is quite stable and seldom needs to be reset. If misconvergence appears at the screen edges, adjust the following. Adjust the tilt control to obtain best horizontal convergence at both sides of screen. If correct convergence cannot be obtained, proceed as follows:

a. If misconvergence is as shown in Fig. 3-9:

Reduce the capacitance value of C611. Try the next smaller commercial value. It will probably be necessary to reset the horizontal static convergence control after C611 has been changed. Readjust the tilt control if necessary.

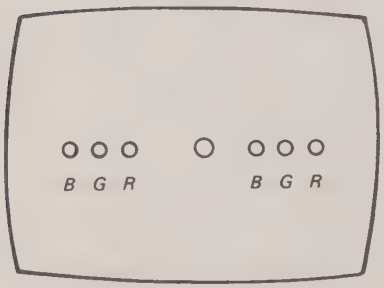


Fig. 3-9. Underconvergence

b. If misconvergence is as shown in Fig. 3-10:

Increase the capacitance value of C611. Try the next larger commercial value. It will probably be necessary to reset the horizontal static convergence control after C611 has been changed. Readjust the tilt control, if necessary.

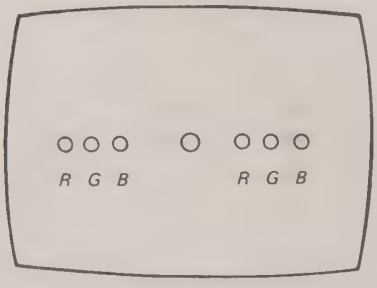
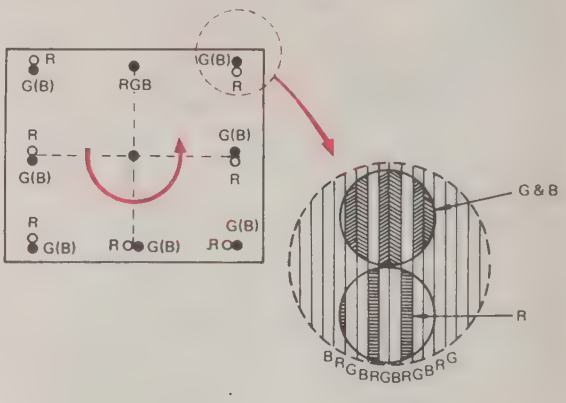


Fig. 3-10. Overconvergence

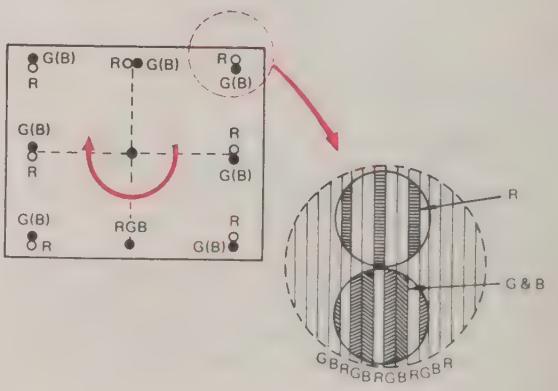
Screen-edge convergence adjustments

In some cases small adjustments made to the deflection yoke can correct minor screen edge misconvergence. Refer to Figs. 3-11 and 3-12. If the conditions shown in these figures are observed, raise or lower the front edge of the deflection yoke as indicated in the figures. To raise or lower the front edge of the deflection yoke, proceed as follows:



To correct this condition (to move the red dot as indicated by the arrow), raise the front edge of the yoke.

Fig. 3-11. Screen-edge convergence adjustments (1)



To correct this condition (to move the red dot as indicated by the arrow), lower the front edge of the yoke.

Fig. 3-12. Screen-edge convergence adjustments (2)

1. Loosen the two screws labeled A and B in Fig. 3-13.
2. Loosen the clamp band labeled C in Fig. 3-14.
3. Raise or lower the front edge of the deflection yoke as indicated in Figs. 3-11 or 3-12. Take care not to move the yoke forward or backward.
4. Secure the yoke in position by tightening the screws labeled A and B in Fig. 3-13. Tighten the clamp band.

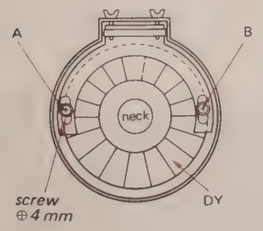


Fig. 3-13. Yoke holding screws

Move the front section of the yoke up or down.

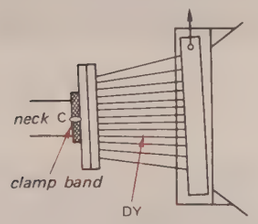


Fig. 3-14. Movement of deflection yoke

3-3. WHITE BALANCE ADJUSTMENTS

It is important to balance primary-color beam current to produce a black-and-white monochrome picture that is free of any predominant hue. Correct white balance is a prerequisite for correct color reproduction.

Landing adjustments should be completed before starting white-balance adjustments.

Preparation:

1. Receive the crosshatch pattern on the screen.
2. Set the horizontal and vertical hold controls for correct sync.

Adjustment Procedure:

Low level white balance adjustments

1. Turn the brightness control and picture control fully counterclockwise.
2. Turn the screen (SCRN) control VR-602 on the P board to obtain a dark screen.
3. Set all three (red, green and blue) background controls to the mechanical center.
4. Turn all three (red, green and blue) drive controls fully clockwise (maximum brightness position).
5. Turn the SCRN control clockwise slowly and note the hue (red, green and blue) of the lines that becomes faintly visible first.
6. Adjust the other two background controls to obtain optimum white balance (neutral gray).
7. Turn the brightness and picture controls clockwise about 45 degrees.
8. Confirm that optimum white balance is obtained on the screen, and if necessary readjust the two background controls that were set at step 6 to obtain optimum white balance.

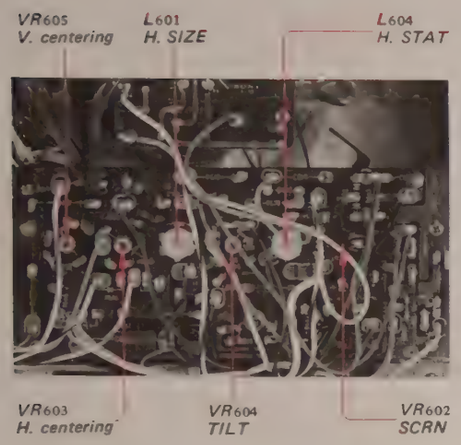
Note: If optimum white balance is not obtained by adjustment of two background controls that were adjusted in step 6, turn the other background control clockwise or counterclockwise no more than 30 degrees and then readjust the remaining two background controls.

High level white balance adjustments

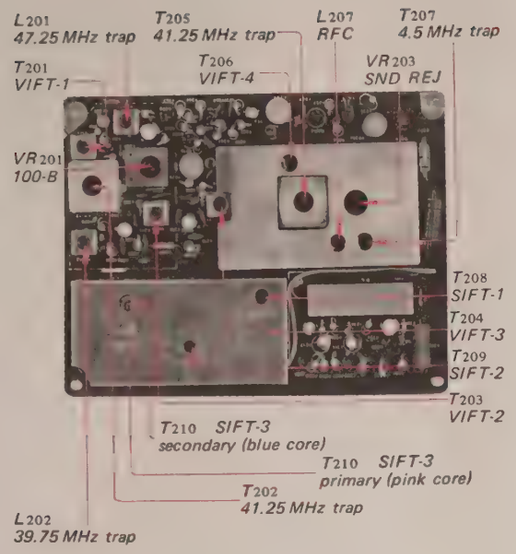
1. Turn the brightness and picture controls fully clockwise.
2. Adjust the all three (red, green and blue) drive controls to obtain optimum white balance.
3. Confirm that optimum white balance is obtained at a faintly visible screen again. If necessary, repeat all of the adjustment procedures.

MEMO

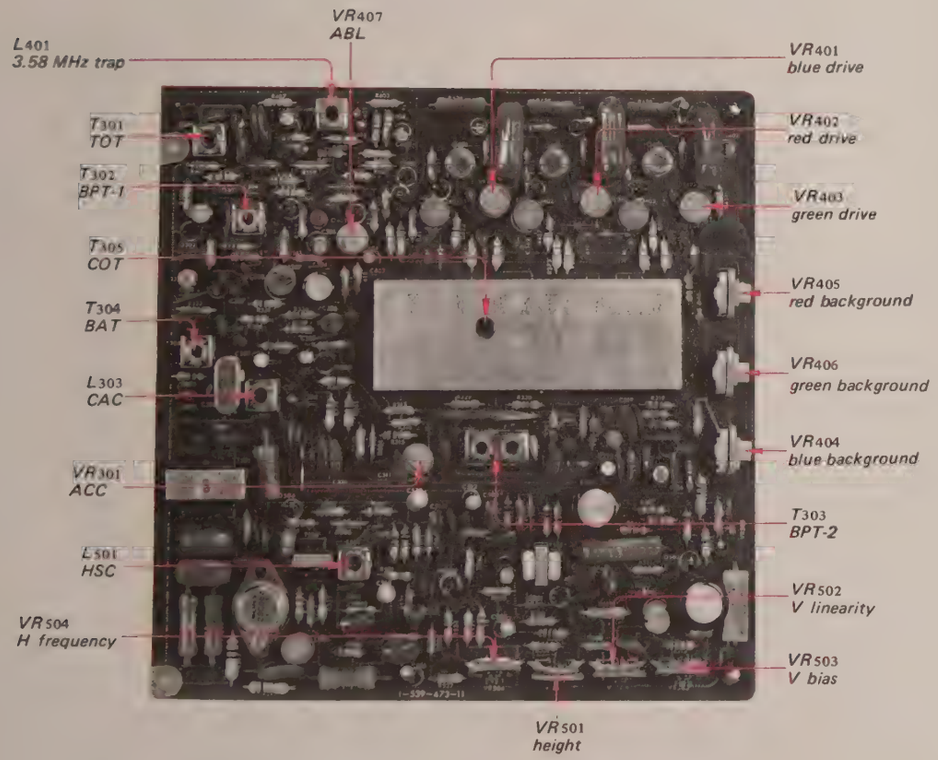
ADJUSTMENT LOCATIONS



P board adjustments



S board adjustments



CD board adjustments

SECTION 4
CIRCUIT ADJUSTMENTS

4-1. COLOR CIRCUIT ADJUSTMENTS

The following service adjustments correct color lock, phase setting, ACC adjustment and 3.58 MHz trap adjustment. Bandpass amplifier adjustment should be corrected before these adjustments are attempted. If there is reason to suspect bandpass amplifier alignment, refer to Section 4-2.

3.58 MHz Oscillator Adjustments

Equipment needed:

Color-bar generator – Leader LCG-387 or equivalent
Oscilloscope
VOM
Bias box (0 to 9V adjustable) See Fig. 4-1.

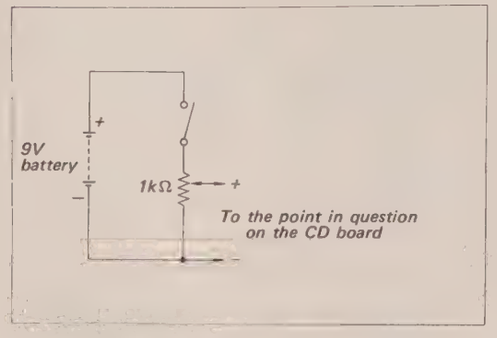


Fig. 4-1. Bias box

Adjustment procedure:

1. Receive the color-bar signal from the color-bar generator.
2. Adjust the horizontal and vertical hold controls to secure correct sync.
3. Set the hue control to the mechanical center.
4. Short the secondary of burst amplifier transformer BAT to the ground with a short jumper lead. See Fig. 4-2.
5. Adjust the core of continuous wave oscillator transformer COT to synchronize the color in the display and for minimum color beat in the picture.

3.58 MHz Trap Coil Adjustments

1. Receive the color-bar signal or rainbow signal.
2. Connect a scope to the emitter of video drive Q409 as shown in Fig. 4-3.
3. Turn the color control fully counterclockwise (minimum).
4. Turn the picture control fully clockwise (maximum).
5. Adjust the trap coil L401 to minimize the 3.58 MHz component on the waveform as shown in Fig. 4-4.

Fig. 4-2. 3.58 MHz oscillator adjustment, Step 4

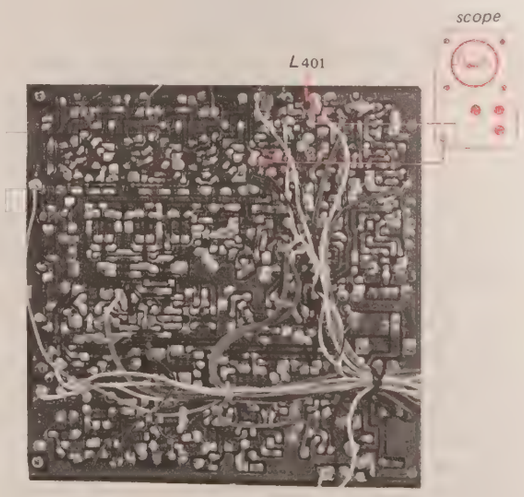


Fig. 4-3. Connections to emitter of video drive

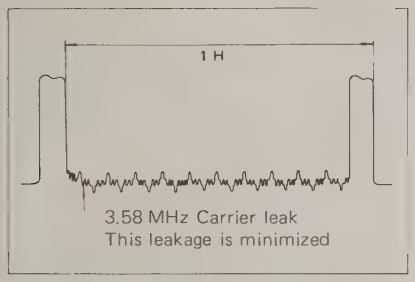


Fig. 4-4. Adjustment of 3.58 MHz traps using a gated-rainbow generator

Burst Amplifier Adjustments

1. Connect a color-bar generator to the VHF antenna terminals and adjust the receiver to produce the color-bar display.
2. Connect the scope to the base of burst amplifier Q305 and check that the burst signal rides around atop the burst gate pulse as shown in Fig. 4-5.
3. Connect a scope to the secondary of burst amplifier transformer BAT. See Fig. 4-6.
4. Adjust the core of BAT for obtaining the maximum amplitude on the scope.

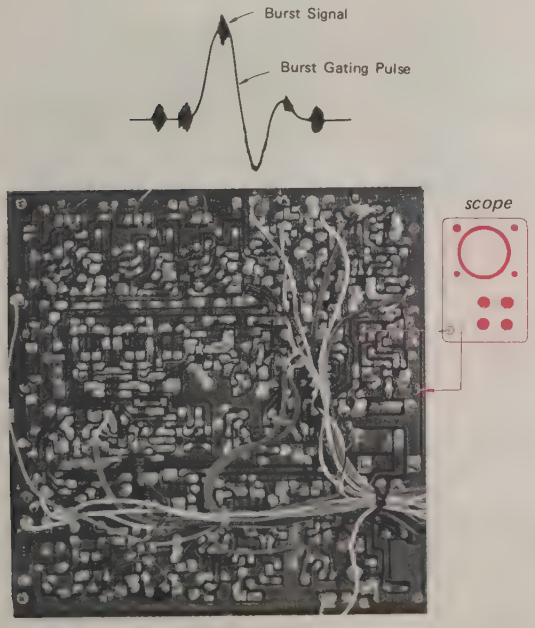


Fig. 4-5. Scope connections to check adjustment of the burst amplifier transformer

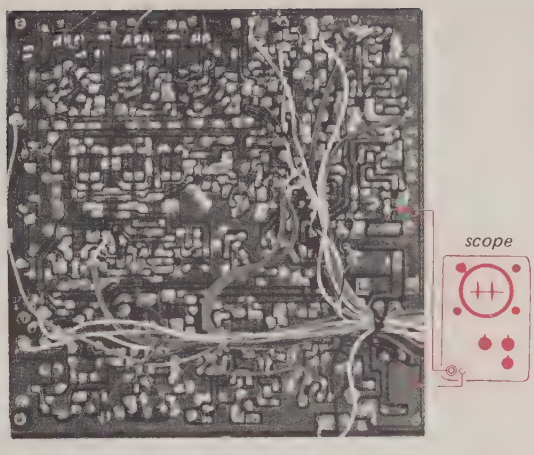


Fig. 4-6. Scope connections to adjust the burst amplifier transformer

Ringing Waveform Adjustments (CW Adjustments)

1. Adjust the burst amplifier as per the foregoing procedures.
2. Connect a scope to the collector of continuous wave drive Q306 as shown in Fig. 4-7.
3. Adjust the crystal resonant frequency adjustment coil CAC to obtain the maximum indication on the scope.
4. Repeat the adjustments for burst amplifier and ringing waveform alternately two or three times.

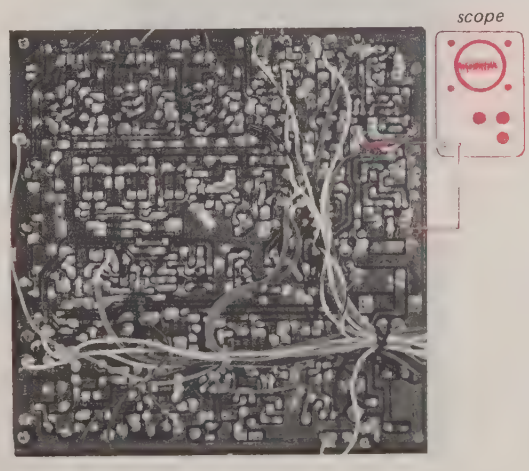
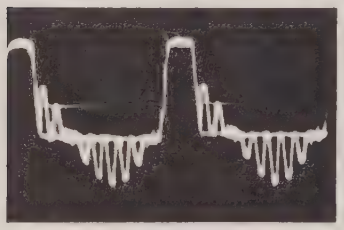


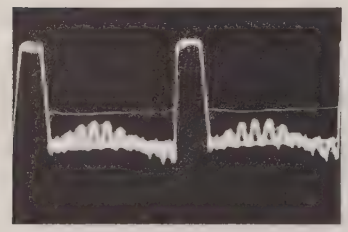
Fig. 4-7. Scope connections to adjust the burst amplifier transformer

Hue Control Range Check

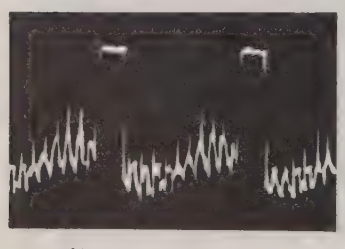
1. Receive the rainbow signal from the rainbow generator.
2. Adjust the horizontal and vertical hold controls to secure correct sync.
3. Set the hue control to the mechanical center.
4. Set the color and picture controls to get the best picture on the screen.
5. Connect a scope to the blue cathode output terminal.
6. Confirm that the blue output waveform appears as shown in Fig. 4-8.
7. If the optimum waveform is not obtained, touch up the burst amplifier transformer BAT.
8. Check that the red and green waveforms are as shown in Fig. 4-8.



Normal blue waveform



Normal green waveform



Normal red waveform

Fig. 4-8. Video output waveform (gated-rainbow display)

ACC Adjustments

1. Receive the color-bar signal or rainbow signal.
2. Adjust the horizontal and vertical hold controls to secure correct sync.
3. Set the hue control to the mechanical center.
4. Set the picture and color controls to get the best picture on the screen.
5. Connect a scope to the emitter of Q210.
6. Adjust the color-bar generator to produce a burst signal of 0.2 Vp-p when the NTSC color-bar signal is used. When the rainbow signal is used, adjust the control to produce 0.2 Vp-p. See Fig. 4-9.

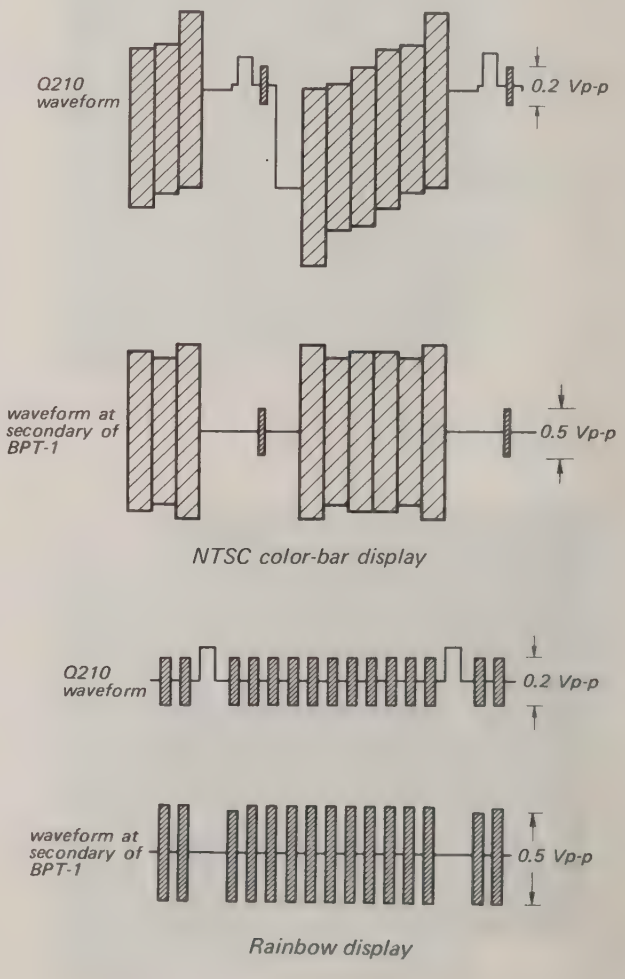


Fig. 4-9. Waveform setup for ACC amplifier

7. Connect a scope to the secondary of 1st bandpass transformer BPT-1.

8. Adjust the ACC control VR-301 to produce the color burst signal of 0.5 Vp-p on the scope.

4-2. VIDEO CIRCUIT ADJUSTMENTS

The need for adjustment is indicated if the set has one or more of the following symptoms.

1. Frequency distortion on a particular channel (no color reproduction on a particular channel).
2. Smeared picture even if Fine Tuning is set correctly.
3. Excessive overshoot (white or black borders on the vertical edges of objects in the picture).
4. Poor color resolution or noisy color.

Local Oscillator Tracking

The following procedure permits local-oscillator tracking adjustments to be made accurately regardless of the state of IF adjustment.

1. Receive an off-the-air signal on the highest active channel in your locality.
2. Loosely couple the output of the marker generator to the r-f terminal of the tuner or the tuner test point.
3. Set the marker generator to 45.75 MHz.
4. Adjust the channel slug (accessible after the Channel Selector and Fine Tuning knobs have been removed) for minimum beat in the picture.
5. Rock Fine Tuning to the left and right to make sure that the beat is minimum at the original setting of the Fine Tuning control.
6. Repeat Step 4 for each active channel, starting with the next lower active channel and ending with the lowest.

Video IF Adjustments

Equipment needed:

Sweep Generator–covering the range of 39–48 MHz
Marker Generator–covering the range of 39–48 MHz (crystal calibrated)
Oscilloscope
Rheostat– 100 k-ohm

Adjustment procedure:

1. Pull out the rf terminal connector of the tuner. See Fig. 4-10.
2. Terminate the rf terminal of the tuner with 75 ohms. See Fig. 4-11.
3. Set the Channel selector to the highest inactive channel in the area.
4. Turn the AGC controls VR-202 and VR-204 fully counterclockwise (maximum gain). See Fig. 4-12.
5. Connect a 100 k-ohm rheostat across resistor R239 as shown in Fig. 4-12.
6. Connect a sweep generator to the test point of the tuner through an attenuator and the network as shown in Fig. 4-13.

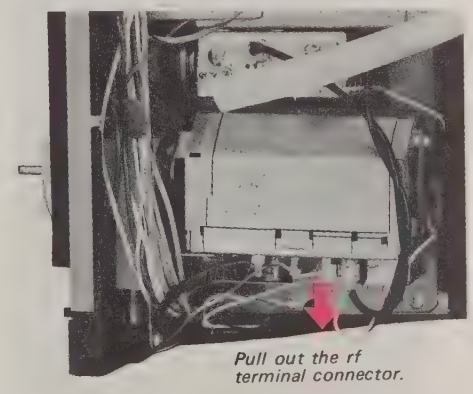


Fig. 4-10. Preparation for VIF adjustment, Step 1

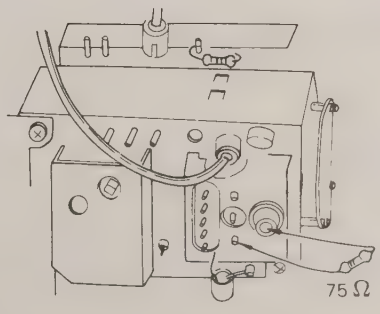


Fig. 4-11. Tuner termination

7. Connect a scope to the emitter of Q210 (TP-4) through the network as shown in Fig. 4-14.
8. Loosely couple the output of the marker generator to the input of the VHF tuner and network as shown in Fig. 4-13.
9. Set the resistance of rheostat to 100 k ohms.
10. Turn on all equipment. Allow 10 minutes for warm up.
11. Set the center frequency of the sweep generator to approximately 45 MHz.
12. Adjust the sweep output to obtain 1.4V(p-p) on the scope.
13. Remove the attenuator and reconnect the sweep to the test point.
14. Adjust the rheostat to obtain 1.4V(p-p) on the scope.
15. Set the marker generator to each of the values indicated in Table 4-1 and tune the transformers for maximum displacement between the marker and the base line on the response curve.

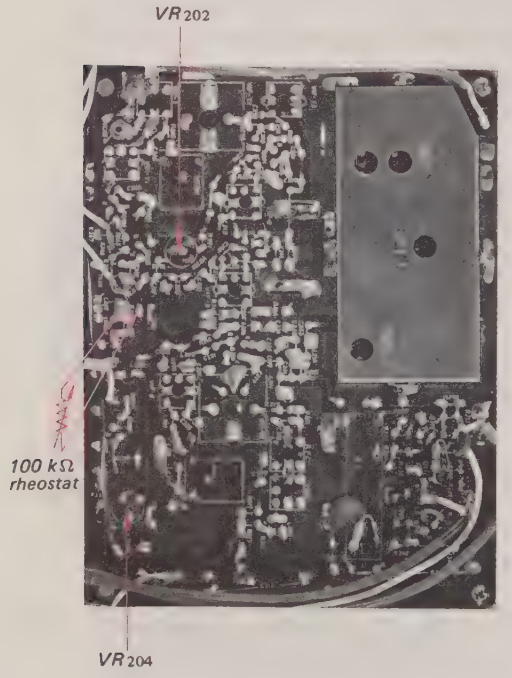


Fig. 4-12. Installation of 100 k-ohm rheostat to establish VIF bias

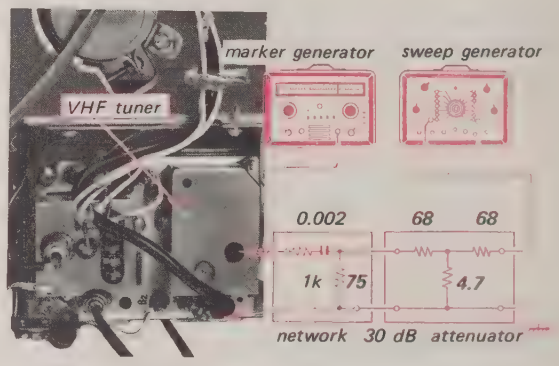


Fig. 4-13. Sweep/marker connections for VIF adjustment

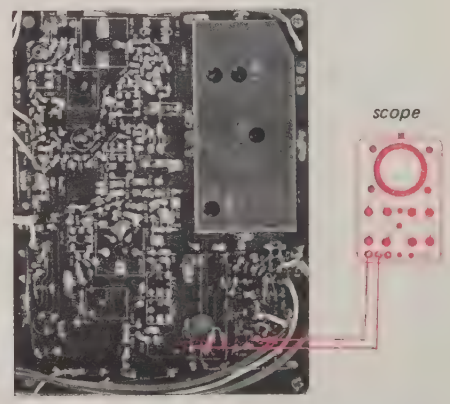
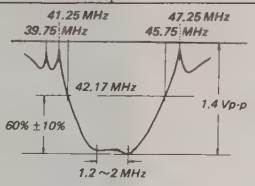
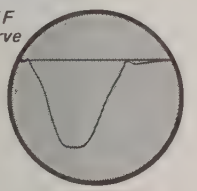


Fig. 4-14. Scope connections for VIF adjustment

TABLE 4-1
VIF ADJUSTMENTS

ITEMS	*MARKER FREQ. (MHz)*	*ADJUST*	*REMARKS*
1. VIFT-2 VIFT-3	44	VIFT-2 and VIFT-3	1. Turn for max. distance between marker and base line.
2. Adjustment of the peak part of IF response curve	45.75 42.17	VIFT-1 CV-201	2. Adjust the IF coil in the tuner until the 45.75 MHz marker point is at the same level as the 42.17 MHz marker point. 3. Adjust the CV-201 and VIFT-1 to position both marker points of 45.75 MHz and 42.17 MHz at 6 dB (50%) below the peak of waveform.
3. Adjustment of three marker traps	47.25 41.25 39.75	VIFT-T-1 VIFT-T-2 VIFT-T-3 VIFT-T-4 VR-201 VR-203	4. Adjust four trap coils (VIFT-T-1 to VIFT-T-4) for minimum indication on the scope. 5. Adjust VR-201 for minimum indication of 47.25 MHz on the scope. 6. Adjust VR-203 for minimum indication of 41.25 MHz on the scope. 7. Repeat items from 1 to 3.
4. Confirmation of the best VIF response curve	 *Idealized VIF response curve* 		8. Confirm that the top of waveform moves up and down* by turning the cores of VIFT-2 and VIFT-3. (* Top of waveform tilts to right or left.) 9. If it does not tilt, readjust items 1 to 3. 10. Change the output level of sweep connected to the test point, while keeping the emitter output level of Q210 at 1.4V(p-p) constant with the 100 k-ohm rheostat. 11. Confirm that the tilt of waveform does not exceed the following value. Difference of level between picture carrier (45.75 MHz) and chroma carrier (42.17 MHz) ..... within 20%. Tilt of top of waveform ..... within 30%.
5. Detector Output Adjustment		VR-204	12. Remove the 100 k-ohm rheostat. 13. Remove 75 ohm resistor from the input terminal of tuner. 14. Connect the rf terminal connector of tuner. 15. Receive a strong off-the-air signal. 16. Adjust the AGC control resistor VR-204 to obtain 1.3V(p-p) (video part) on the scope. 17. Remove the scope connection.
6. Tuner AGC		VR-202	1. Receive an off-the-air signal. 2. Adjust the tuner AGC control VR-202 for minimum noise (snow) and crossmodulation. Check each channel.
7. 4.5 MHz Trap		T207	1. Receive an off-the-air signal. 2. Turn the Fine tuning knob clockwise to obtain the sound beat on the screen. 3. Turn the core of 4.5 MHz trap coil to obtain minimum 4.5 MHz beat on the screen.

Elimination of beat signals in Channel 6

1. Set the Channel Selector to the Channel 6.
2. Receive the color-bar modulated signal of 90 dB or a strong Channel 6 off-the-air signal.
3. Set the fine tuning knob to display the chroma beat stripe on the screen.
4. Adjust the tuner agc control VR-202 to display the stripe clearly on the screen.
5. Set the control VR-1 in the tuner to eliminate the stripe on the screen.
6. Readjust tuner agc VR-202 as described in VIF ADJUSTMENTS.

Bandpass Amplifier Adjustments

Equipment needed:

VOM	– 20 k-ohms per volt or more
Video sweep generator	– 0 ~ 5 MHz (RCA WR-69A or equivalent)
Marker generator	– 39 ~ 48 MHz (RCA WR-99A or equivalent)
Demodulator probe	
Video marker	– Absorption type (RCA WG-295C or equivalent)
Bias box	– 0 ~ 9 volts

Adjustment procedure:

Second Bandpass Amplifier Adjustments

1. Set the Channel Selector to the highest inactive channel in the area.
2. Short the base of the color killer amplifier Q304 to ground with a short jumper.
3. Turn the picture control fully clockwise, and then turn it counterclockwise about 60 degrees.
4. Connect a sweep generator to the center terminal of color control VR-904 through the network shown in Fig. 4-15.
5. Loosely couple the marker generator to the output of sweep generator.
6. Connect a scope to the secondary of BPT-2 through the network shown in Fig. 4-16.
7. Adjust the core of BPT-2 to obtain the response curve shown in Fig. 4-17.

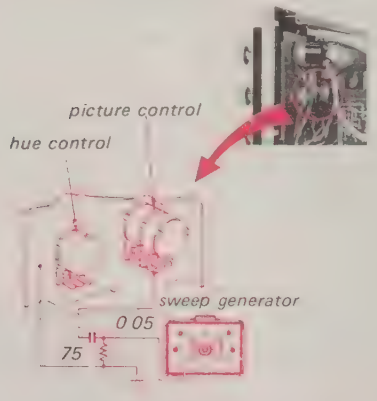


Fig. 4-15. Sweep connections for adjustment of second bandpass amplifier

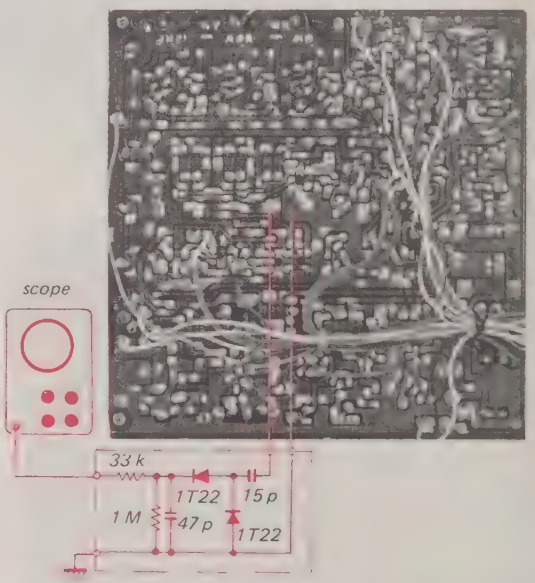


Fig. 4-16. Scope connections to check adjustment of second bandpass amplifier

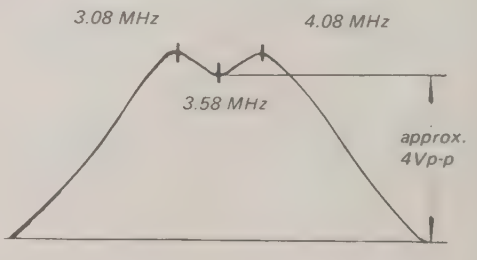


Fig. 4-17. Response curve of second bandpass amplifier

Overall Bandpass Adjustments

The following adjustments are made to check correct relations between the response curve of bandpass amplifier and that of the VIF system.

1. Set the Channel Selector to the highest inactive channel in the area.
2. Turn the picture control fully clockwise, and then turn it counterclockwise about 90 degrees.
3. Short the base of color killer amplifier Q304 to ground with a short jumper.
4. Connect the bias box across capacitor C309.
5. Connect a 100 k-ohm rheostat across resistor R239.
6. Connect a sweep generator and a marker generator to the tuner test point as shown in Fig. 4-18.
7. Set the sweep signal to a center frequency of 3.58 MHz and a sweep width of approximately 2 MHz.
8. Set the marker frequency to 45.75 MHz.
9. Connect the demodulator probe of the scope to the emitter of Q212.
10. Set the 100 k-ohm rheostat for 0.5(Vp-p) on the scope.
11. Reconnect the scope to the secondary of BPT-1.
12. Adjust the bias box to obtain 1.0(Vp-p) on the scope.
13. Reconnect the scope to the secondary of BPT-2.
14. Adjust the color control VR-904 to obtain 4.0(Vp-p) on the scope.

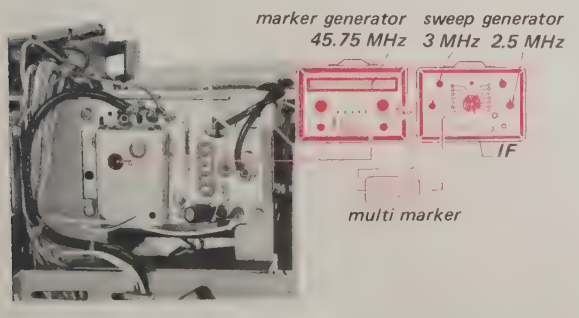


Fig. 4-18. Sweep/marker connections for overall-bandpass sweep checks

15. Adjust the core of the take-off transformer TOT for maximum displacement between the 4.1 MHz marker and the baseline.
16. Adjust the core of BPT-1 for maximum displacement between the marker (3.1 MHz – 3.3 MHz) and the baseline to obtain the response curve shown in Fig. 4-19.
17. Repeat steps 15 and 16 two or three times.

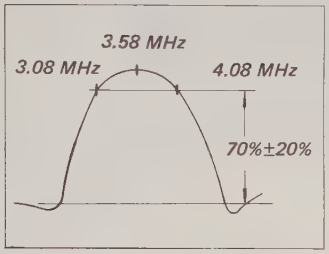


Fig. 4-19. Overall VIF/bandpass amplifier adjustment curve

4-3. SOUND IF ALIGNMENTS

Equipment needed:

Sweep Generator
Marker Generator
Oscilloscope
VOM
100 k-ohm Rheostat

Procedure:

1. Set the Channel Selector to a highest inactive channel in the area.
2. Connect the output of the sweep generator between L210 and C243.
3. Loosely couple the output of the marker generator to the output lead of the sweep generator.
4. Connect the scope across a capacitor C263 as shown in Fig. 4-20.
5. Connect the 100 k-ohm rheostat across the resistor R239.
6. Turn on all equipment, allow 10 minutes for warmup.
7. Set the 100 k-ohm rheostat to make all video disappear from the picture tube (blank raster).
8. Repeat the steps in Table 4-2 to produce the waveform shown in Fig. 4-21.

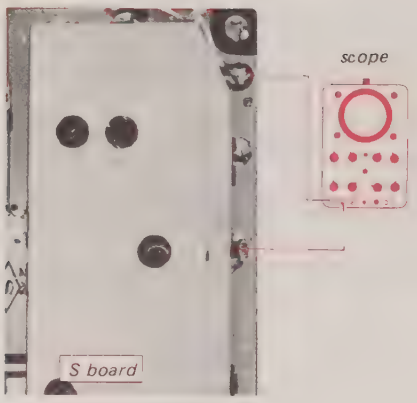


Fig. 4-20. Scope connections for SIF alignment

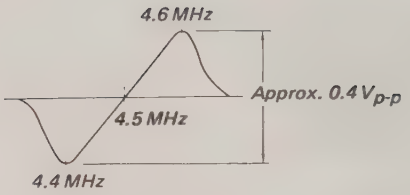


Fig. 4-21. SIF alignment curve

TABLE 4-2
SIF ALIGNMENTS

STEP	MARKER FREQ. (MHz)	ADJUST	REMARKS
1	4.5	SIFT-1, SIFT-2	Turn up sweep output to produce an S curve. Adjust the cores of SIFT-1 and SIFT-2 for maximum deflection on the scope.
2	4.5	Pink Core of SIFT-3	Turn the core to make the S curve symmetrical, and have it cross the baseline at 4.5 MHz.
3	4.5 MHz with 400–600 Hz AM Modulation	Blue Core of SIFT-3	Turn the core for minimum indication of the 400 –600 Hz signals.

4-4. DEFLECTION CIRCUIT ADJUSTMENTS

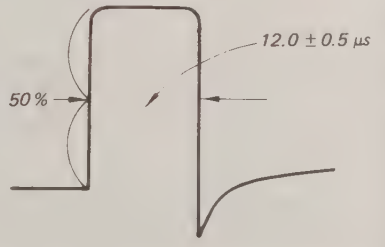
Equipment needed:

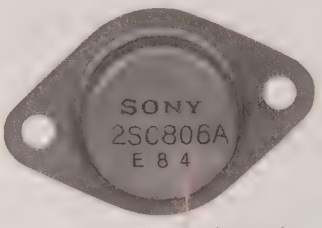
VTVM
Oscilloscope
Color-bar/dot/crosshatch Generator

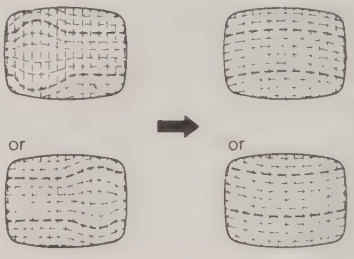
Adjustment procedure:

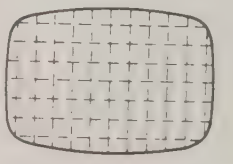
Connect an antenna to the receiver and tune the receiver to a local channel.

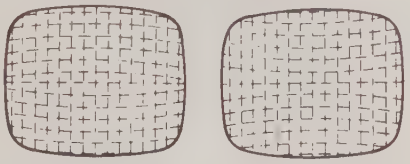
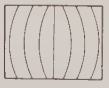
TABLE 4-3
DEFLECTION CIRCUIT ADJUSTMENTS

ITEMS	*ADJUST*	*PREPARATION*	*ADJUSTMENT PROCEDURE*
Horizontal Frequency Adjustment	VR504	1. Receive an off-the-air signal. 2. Set the H. hold control to midrange. 3. Short-circuit horizontal stabilizing coil. 4. Connect a 0.01 μF capacitor between base of Q503 and ground. 5. Adjust the vertical hold to give a slowly rolling picture.	Adjust H. frequency control VR-504 to give a slowly moving picture in horizontal direction.
Horizontal Stabilizing Coil (HSC) Adjustment	HSC	6. Remove the short-circuit from horizontal stabilizing coil.	Adjust the HSC to give a slowly moving picture in horizontal direction. Disconnect the 0.01 μF capacitor which is connected between base of Q503 and ground. Confirm that the picture is locked on the screen.
Horizontal Pulse Width Adjustment	C523	1. Receive an off-the-air signal. 2. Connect a scope to emitter of Q504.	Select values for C523, between 0 – 0.0033 μF, to obtain the pulse width of 11.5 to 12.5-μsec. See Fig. 4-22.  *Fig. 4-22. Horizontal pulse waveform*

<table>
<tr><th>ITEMS</th><th>ADJUST</th><th>PREPARATION</th><th>ADJUSTMENT PROCEDURE</th></tr>
<tr><td>Horizontal Drive Adjustment</td><td>R540</td><td rowspan="2">NOTE: Mark 4 of 2SC806A-4 indicates the h_{FE} rating of transistor. It is identified on the transistor as shown in Fig. 4-23.
 

h_{FE} rating mark
Fig. 4-23. Location of h_{FE} rating on the 2SC806A</td><td>If a horizontal output transistor has been replaced, change R540 according to the table below.
<table><tr><th>Q801</th><th>R540</th></tr><tr><td>2SC806A - 4</td><td>27 ohms</td></tr><tr><td>2SC806A - 5</td><td>33</td></tr><tr><td>2SC806A - 6</td><td>43</td></tr><tr><td>2SC806A - 7</td><td>43</td></tr></table></td></tr>
<tr><td>Converter Driver Adjustment</td><td>R541</td><td>If a converter output transistor has been replaced, change R541 according to the table below.
<table><tr><th>Q802</th><th>R541</th></tr><tr><td>2SC806A - 4</td><td>27 ohms</td></tr><tr><td>2SC806A - 5</td><td>33</td></tr><tr><td>2SC806A - 6</td><td>43</td></tr></table></td></tr>
<tr><td>Horizontal Size Adjustment</td><td>L601</td><td>1. Receive the test pattern.
2. Adjust H. hold and V. hold for correct sync. purpose.
3. Adjust brightness and picture controls to obtain the best picture.
4. Confirm that the collector voltage of Q801 is 73~77V with a VTVM.</td><td>Adjust horizontal size control L601 while observing the picture to produce optimum picture size.</td></tr>
<tr><td>Horizontal Centering Adjustment</td><td>VR-603</td><td>5. Set the H. hold control to mid-range.</td><td>Adjust H. Centering Control VR-603 while observing the picture to locate the picture at the center of the screen.</td></tr>
<tr><td>Pincushion Correction Adjustment</td><td>L908
T905
C808</td><td>1. Receive the crosshatch signal.
2. Set the brightness and picture controls to the lowest level that produces a visible picture.
3. Set vertical height and linearity.
4. Set the sliding core, at the top of the pincushion transformer, to the mechanical center.</td><td>Adjust the phase adjustment coil L908 to obtain pattern as shown in Fig. 4-24.
 

Adjust the phase coil to center bulge
Fig. 4-24. Pincushion adjustments
Then, slide the I type core to obtain pattern shown in Fig. 4-25.
 
Fig. 4-25. Correct pincushion adjustment</td></tr>
</table>

ITEMS	*ADJUST*	*PREPARATION*	*ADJUSTMENT PROCEDURE*
			If there is still a pincushion distortion, change damping resistor R917 as directed in Fig. 4-26. *"Pincushion Distortion"* *"Barrel Distortion"*  *3.3kΩ→3.9kΩ* *3.3kΩ→2.7kΩ* *Fig. 4-26. Incorrect pincushion amplitude requires a change in the damping resistor R917.* *Reduce the value of C808*  *Increase the value of C808* If the pincushion distortion is shown in Fig. 4-27, adjust the capacitance value of C808 to obtain the correct pattern. *Fig. 4-27.*
Vertical Bias Adjustment	VR-503	1. Set the H. and V. hold for correct sync. 2. Adjust brightness and picture to obtain the best picture. 3. Confirm that collector voltage of Q901 is 83 to 87V.	Adjust VR-503 to obtain the emitter voltage of 6.8 to 7.2V at Q901.
Vertical Height and Linearity Adjustment	VR-501 VR-502	1. Receive the test pattern. 2. Set H. and V. hold for correct sync. 3. Adjust brightness and picture controls to obtain the best picture. 4. Confirm that the collector voltage is 83 to 87V.	Adjust height control VR-501 and linearity control VR-502 while observing the picture, to produce best picture height and linearity.
Focus Adjustment	Focus Lead	1. Receive an off-the-air signal. 2. Set H. and V. hold for correct sync. 3. Set brightness and picture controls for a normally bright picture.	Try the focus lead at each of the connecting points on the P board. Connect permanently at the point that gives best focus.
115V Line Adjustment	VR-601	4. Connect the VOM between 115V line and ground.	Adjust VR-601 to obtain 113 to 117V.

4-5. TI CIRCUIT ADJUSTMENTS

Perform the following adjustments before starting the TI block adjustment.

1. Vertical Linearity
2. Vertical Height
3. Vertical Centering
4. Tuner AGC
5. Vertical Hold

TABLE 4-4
TI CIRCUIT ADJUSTMENTS

ITEMS	*ADJUST-MENT*	*PREPARATION*	*ADJUSTMENT PROCEDURE*
T851 (45.75 MHz)	T851 VR-851	1. Receive an off-the-air color signal. See Note 1. 2. Turn the fine tuning knob to obtain the best picture on the screen. 3. Connect a VOM to the base of Q852.	1. Turn the core of T851 for minimum indication on the VOM. 2. Adjust VR-851 for a voltage reading of 1.6V. 3. Repeat the steps 1 and 2 a few times, and finish these adjustments at step 1.
Veil Height	VR-505	1. Receive an off-the-air color signal. 2. Turn the fine tuning knob to obtain the best picture on the screen. 3. Set the BRT and PICT controls for a bright picture.	1. Adjust VR-505 to obtain a veil height of approx. 1/8-inch on the screen.

Notes: 1) Adjust the fine tuning knob to eliminate the 920kHz beat on the screen.

2) Check that normal conditions are seen on the screen in all channels after the adjustment has been made.

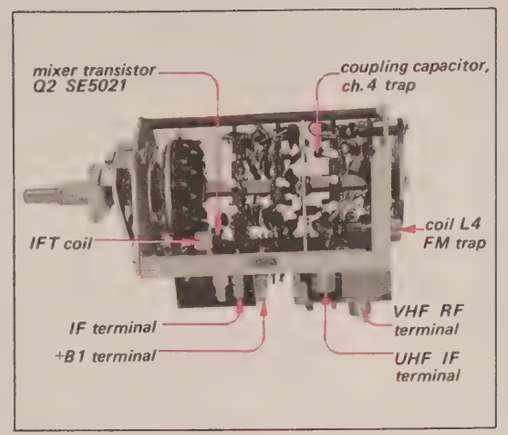
SECTION 5
VHF TUNER

5-1. GENERAL INFORMATION

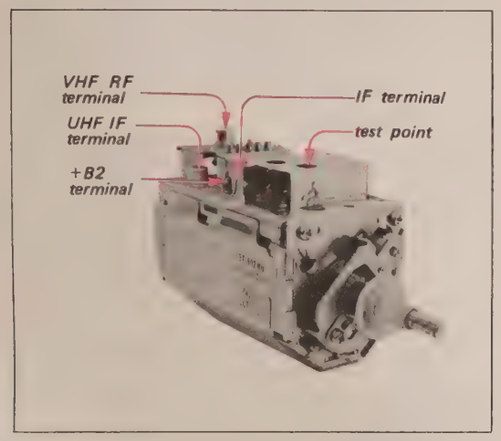
The BT-602 Wu vhf tuner is used in the SONY Trinitron color television KV-1220U. It is specially designed for color reception. Therefore, this tuner has outstanding sensitivity and signal-handling ability.

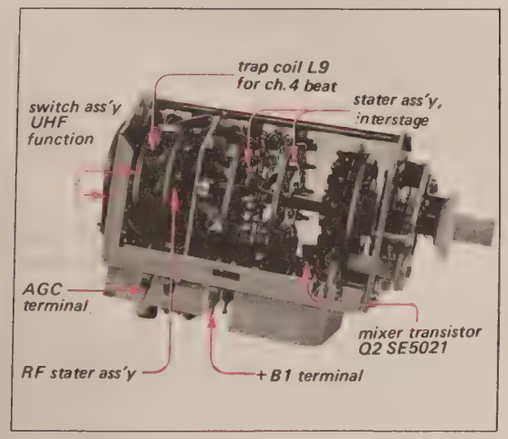
This tuner uses a total of three NPN transistors; an SE5020 in the rf amplifier, an SE5021 in the mixer and an SE3001 in the local oscillator. All the coils and contacts for channel selection are mounted on the switch wafers.

All transistors and other electrical parts are mounted on the tuner case, and are covered with the shield case. RF coils for each channel can be adjusted independently.



5-2. EXTERNAL AND INTERNAL VIEW





5-3. DISASSEMBLY

Tuner Cover Removal

1. Push both side of the cover with the hands as shown in Fig. 5-1.
2. Pry open the cover with a screwdriver. (See Fig. 5-2.)
3. Pull out the cover from the tuner case as shown in Fig. 5-3.

Tuner Shaft Assembly Removal

1. Set the Channel Selector to the UHF position as shown in Fig. 5-4.
2. Remove the tuner cover.
3. Straighten the bent portion of the prop plate with pliers as shown in Fig. 5-5.
4. Unsolder the shield plate that is located on the prop plate as shown in Fig. 5-5.
5. Remove a screw labeled A in Fig. 5-5.
6. Remove the prop plate.
7. Remove the two screws labeled B1-2 in Fig. 5-6.
8. Pull out the tuner shaft assembly.

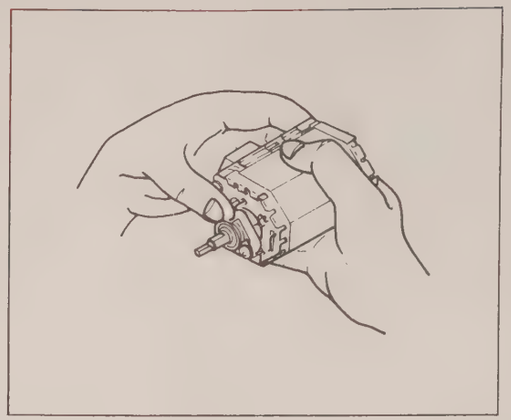


Fig. 5-1. Tuner cover removal (1)

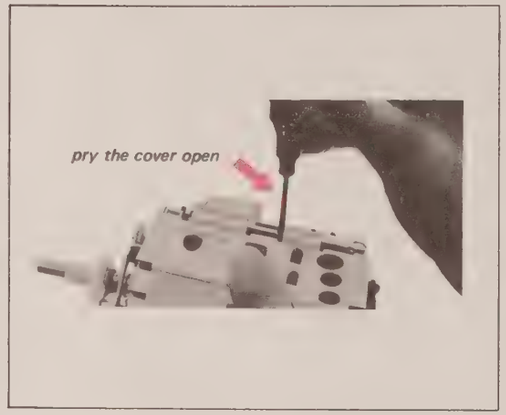


Fig. 5-2. Tuner cover removal (2)

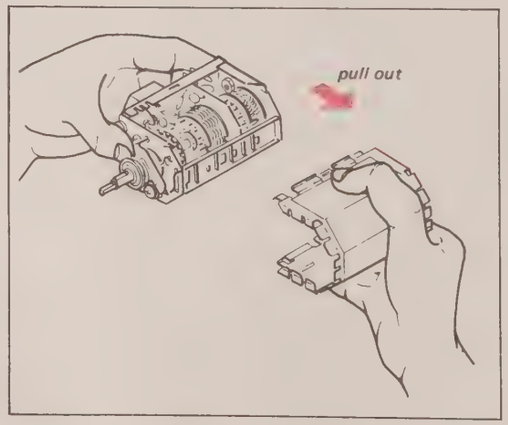


Fig. 5-3. Tuner cover removal (3)

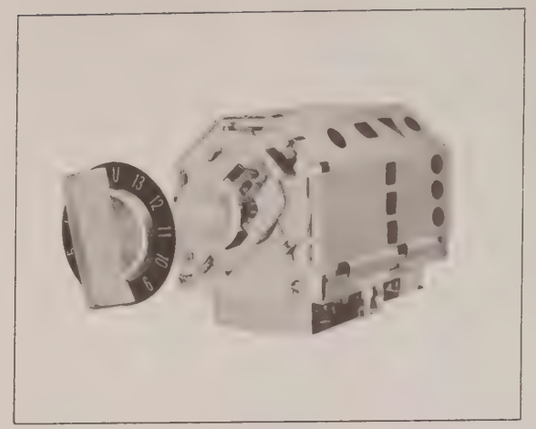


Fig. 5-4. Tuner shaft assembly removal (1)

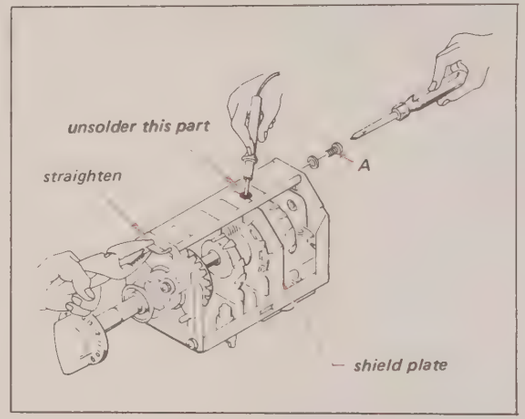


Fig. 5-5. Tuner shaft assembly removal (2)

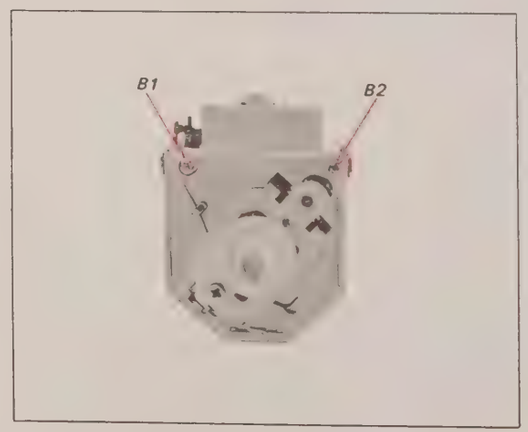
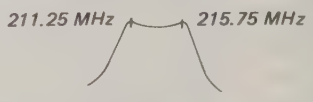
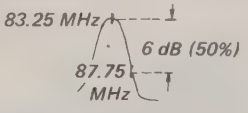
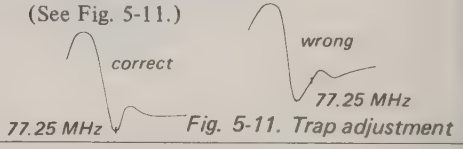
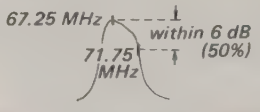


Fig. 5-6. Tuner shaft assembly removal (3)

STEP	CHANNEL	ADJUST	MARKER POINTS (MHz)		ADJUSTMENT PROCEDURE
			VIDEO	SOUND	
1	13	Lb 13, Lc 13	211.25	215.75	Adjust interstage coils Lb 13 and Lc 13 to position both markers (211.25 MHz and 215.75 MHz) at the peaks of the response curve. (See Fig. 5-9.)  Fig. 5-9. Ch 13 response curve
2	12 11 10 9 8 7	Lb 12, Lc 12 Lb 11, Lc 11 Lb 10, Lc 10 Lb 9, Lc 9 Lb 8, Lc 8 Lb 7, Lc 7	205.25 199.25 193.25 187.25 181.25 175.25	209.75 203.75 197.75 191.75 185.75 179.75	Adjust each interstage coil same as described in the above procedure. However, pay attention to the differences in the markers at each channel.
3	6	Lb 6, Lc 6	83.25	87.75	Adjust interstage coils Lb 6 and Lc 6 to position the 83.25 MHz marker at the peak of response curve, and the 87.75 MHz marker at 6 dB (50%) below the video marker as shown in Fig. 5-10.  Fig. 5-10. Ch 6 response curve
4	4	Trap L 9	77.25		Sweep the sweep generator at 70 MHz. Adjust trap coil L 9 until the 77.25 MHz video marker appears at the dip in the curve as seen on the scope. (See Fig. 5-11.)  Fig. 5-11. Trap adjustment
5	5	Lb 5, Lc 5	77.25	81.75	Adjust interstage coils Lb 5 and Lc 5 as same as in step 1. But pay attention to the differences in marker frequencies.
6	4	Lb 4, Lc 4	67.25	71.75	Adjust interstage coils Lb 4 and Lc 4 to position the 67.25 MHz marker at the peak of response curve, and the 71.75 MHz marker within 6 dB (50%) below the video marker as shown in Fig. 5-12.  Fig. 5-12. Ch4 response curve
7	3 2	Lb 3, Lc 3 Lb 2, Lc 2	61.25 55.25	65.75 59.75	Adjust the each coil as same as step 1. But pay attention to the differences in marker frequencies for each channel.

UHF-IF Adjustments

1. Connect a sweep generator to rf input terminal of tuner through the network as shown in Fig. 5-13.
2. Loosely couple the output of a marker generator to the output lead of the sweep generator as shown in Fig. 5-13.
3. Connect a scope to the test point through a detector as shown in Fig. 5-13.
4. Set the sweep generator so that the output level of about 70 dB is obtained.
5. Connect a dc power supply to +B terminal for supplying 12 V dc. (See Fig. 5-13.)
6. Connect an another dc power supply to agc terminal for supply 1.6 V dc. (See Fig. 5-13.)
7. Adjust two coils LB1 and LC1 to produce the waveform shown in Fig. 5-14.

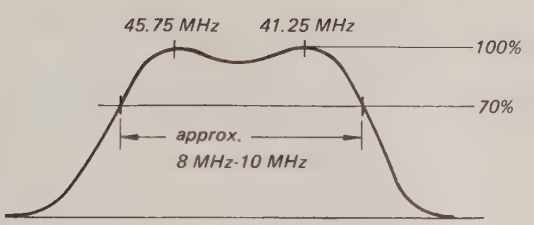
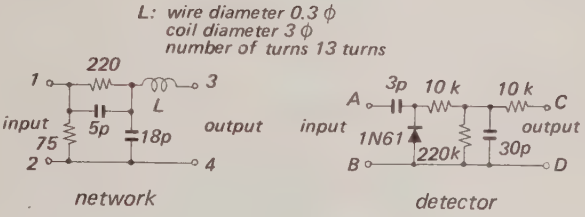


Fig. 5-14. UHF-IF response curve



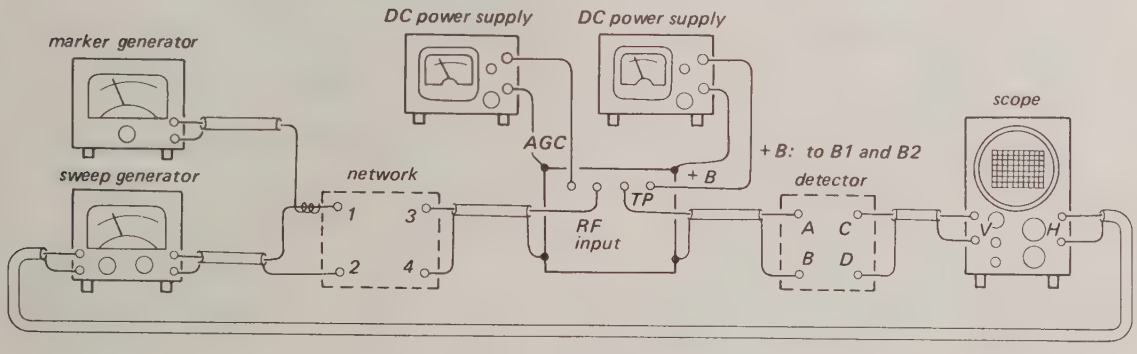


Fig. 5-13. Equipment setup

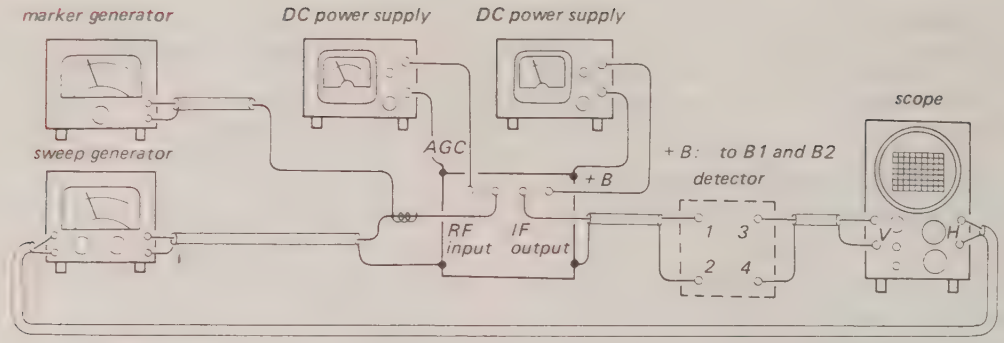
Standard Injection-voltage Values for Each Channel

1. Connect a high-frequency milli-voltmeter to the test point.
2. Connect a dc power supply to +B terminal for supplying 12 V dc.
3. Connect an another dc power supply to agc terminal for supplying 1.6 V dc.

ch.	13	12	11	10	9	8
mv.	145	150	150	140	165	165
ch.	7	6	5	4	3	2
mv.	165	195	205	200	200	190

IF Output Transformer Adjustments

1. Connect a sweep generator and a marker generator to rf input terminal of tuner as shown in Fig. 5-15.
2. Connect a scope to i-f output terminal through a detector as shown in Fig. 5-15.
3. Connect a dc power supply to +B terminal for supplying 12 V dc. (See Fig. 5-15.)
4. Connect an another dc power supply to agc terminal for supplying 1.6 V dc. (See Fig. 5-15.)
5. Set the Channel selector to Ch. 13.
6. Adjust i-f transformer to obtain the waveform shown in Fig. 5-16.



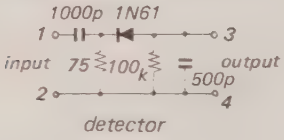


Fig. 5-15. Equipment setup

FM Trap Coil L4 Adjustments

1. Connect a sweep generator and a marker generator to rf input terminal as shown in Fig. 5-17.
2. Connect a scope to the base of rf transistor Q1 through a detector as shown in Fig. 5-17.
3. Connect a dc power supply to +B terminal for supplying 12 V dc.
4. Connect an another dc power supply to agc terminal for supplying 1.6 V dc.
5. Adjust the fm trap coil L4 to obtain the waveform shown in Fig. 5-18.
6. If the fm interference beat appears on the screen when connecting this tuner to the set, turn the core of L4 slightly to obtain the best picture.

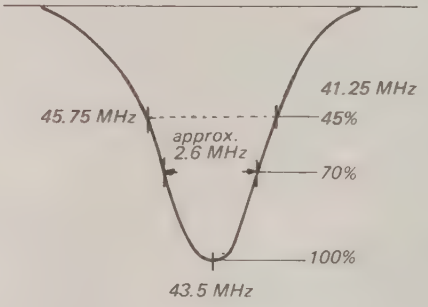


Fig. 5-16. Mixer output response curve

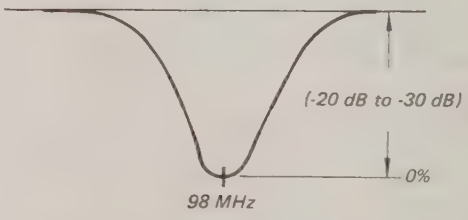
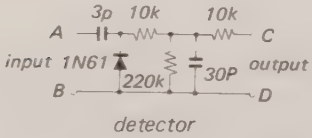


Fig. 5-18. Response curve



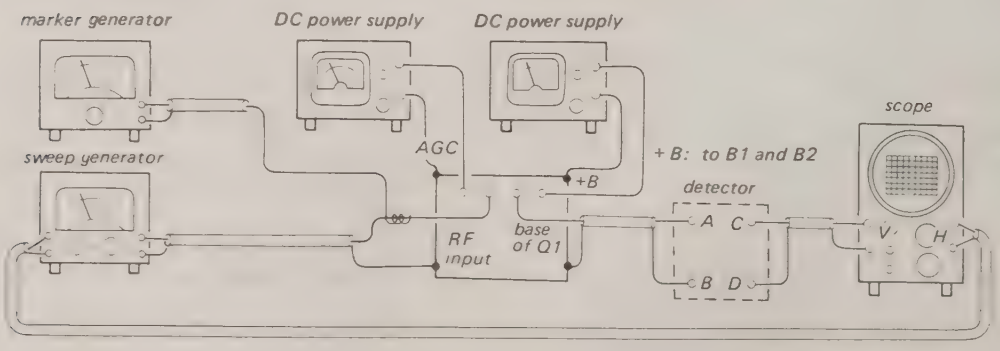
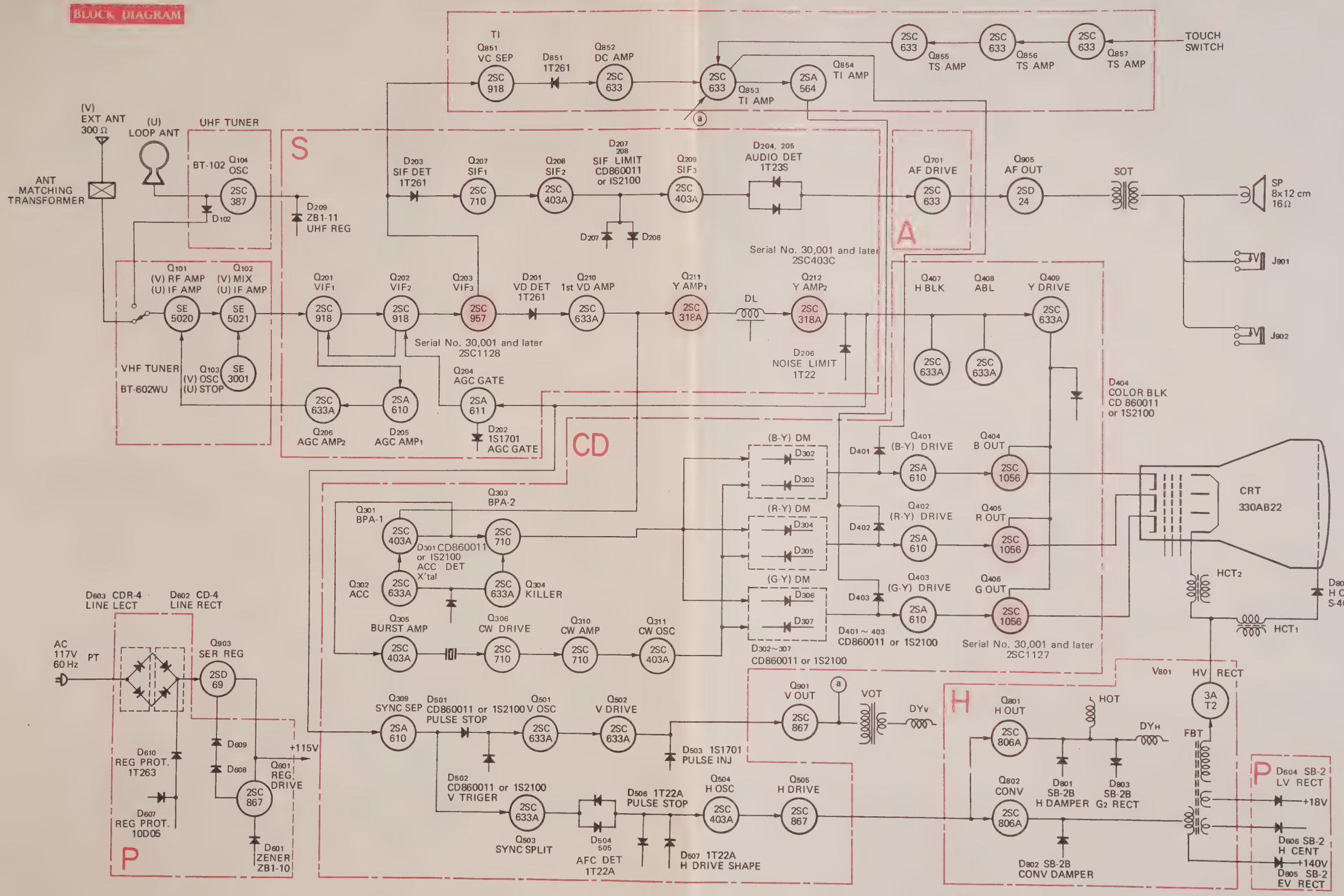


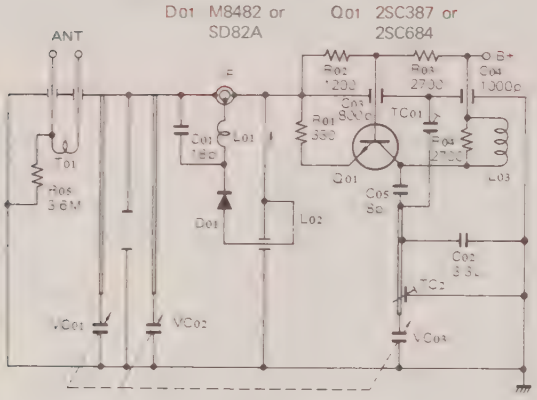
Fig. 5-17. Equipment setup

BLOCK DIAGRAM

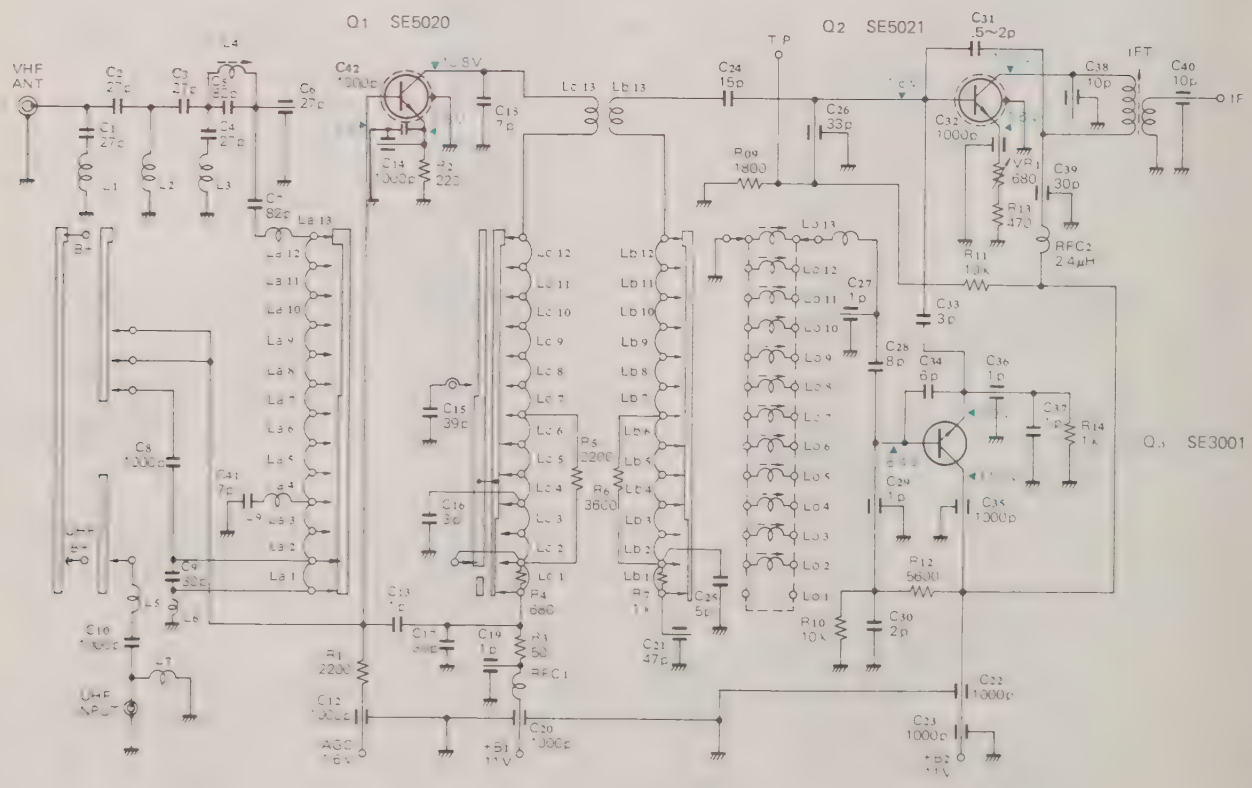


SCHEMATIC DIAGRAM

UHF TUNER

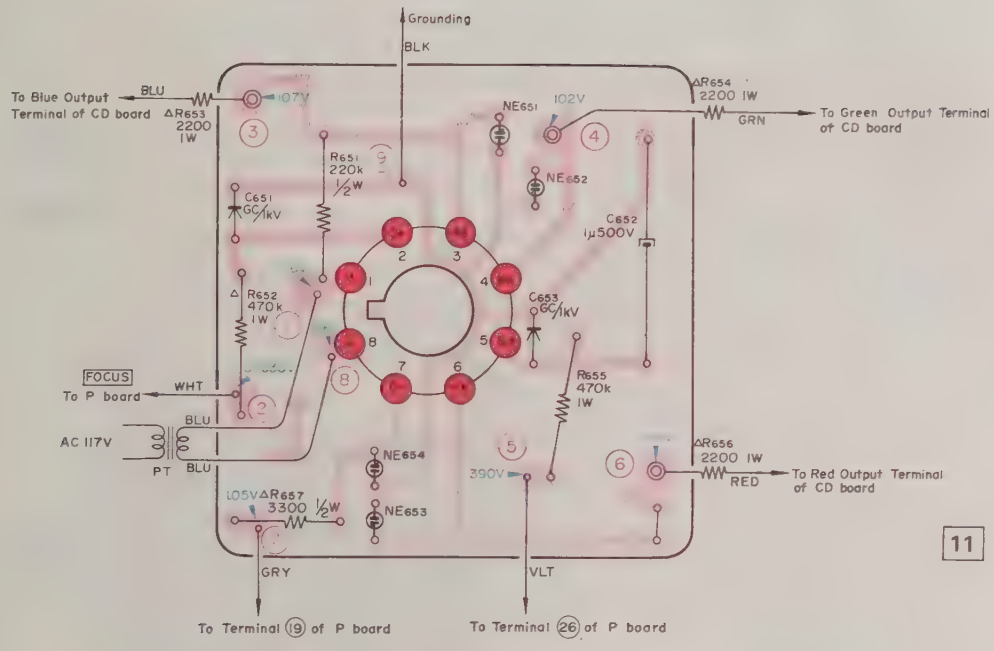


VHF TUNER



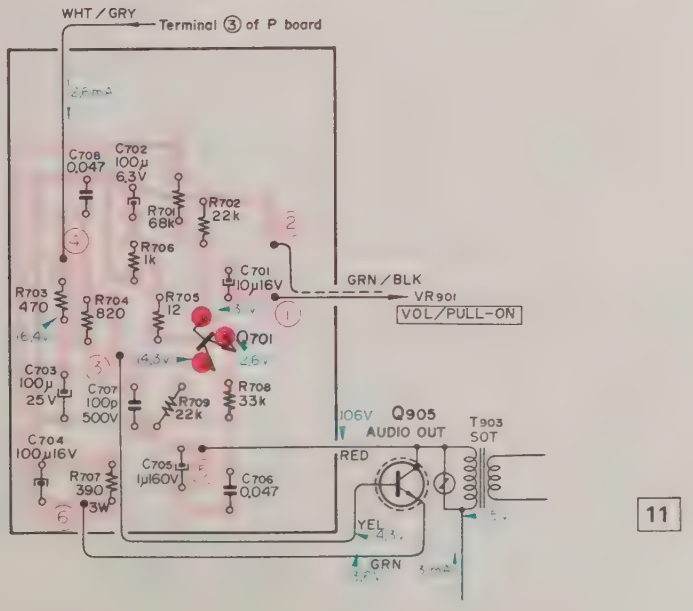
MOUNTING DIAGRAM

T Circuit Board (for all chassis)



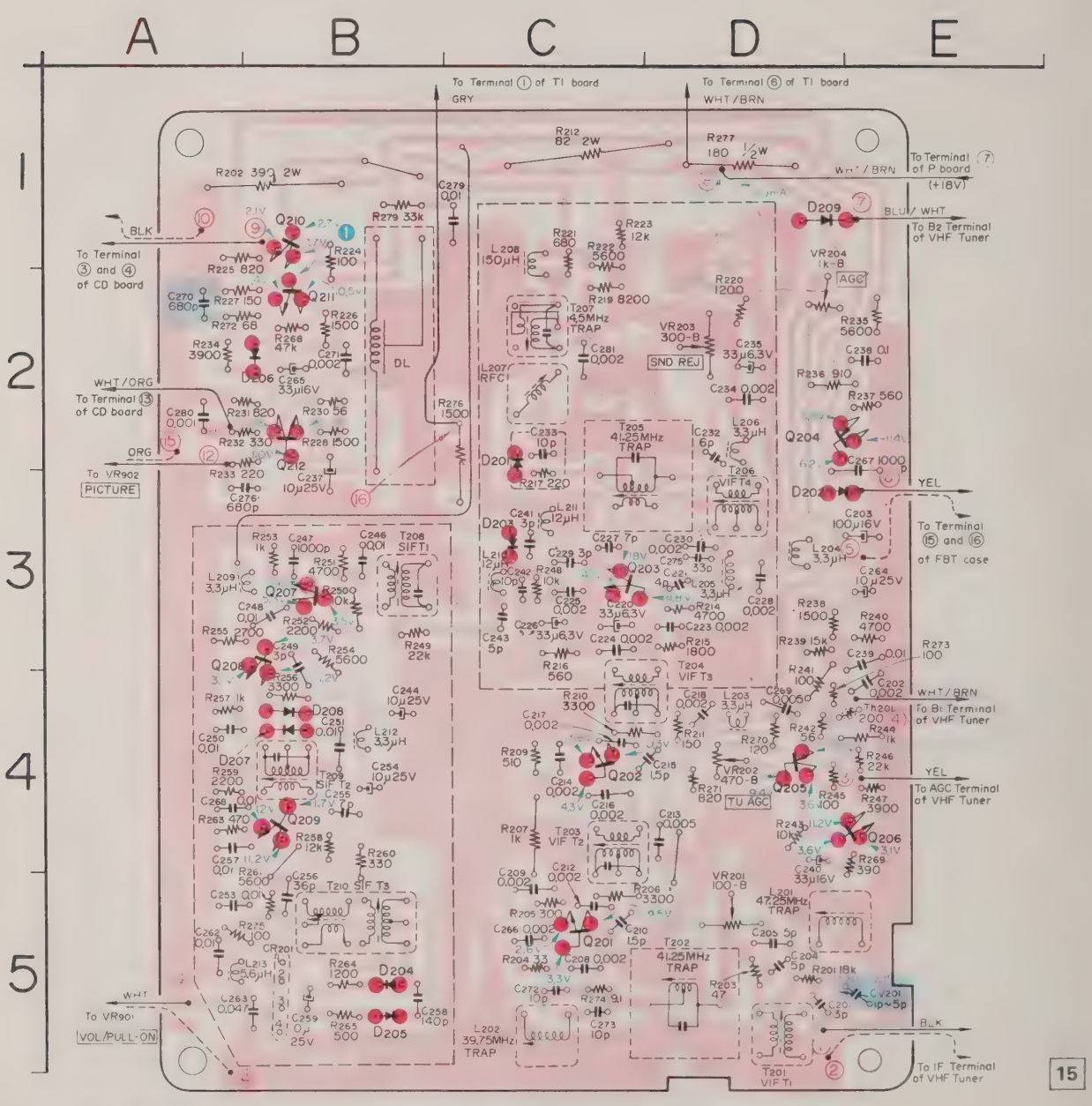
MOUNTING DIAGRAM

A Circuit Board (for all chassis)



MOUNTING DIAGRAM

S Circuit Board (for all chassis)



15

TRANSISTORS

Q201	C-5	2SC918
Q202	C-4	2SC918
Q203	C-3	2SC957
Q204	D-2	2SA611
Q205	D-4	2SA611
Q206	E-4	2SC633A
Q207	B-3	2SC710
Q208	B-4	2SC403A
Q209	B-4	2SC403A
Q210	B-1	2SC633A
Q211	B-2	2SC318A
Q212	B-2	2SC318A

DIODES

D201	C-3	1T261
D202	D-3	1S1701
D203	C-3	1T261
D204	B-5	1T23S
D205	B-5	1T23S
D206	B-2	1T22
D207	B-4	CD860011 or 1S2100
D208	B-4	CD860011 or 1S2100
D209	D-1	ZB1-11

Note:

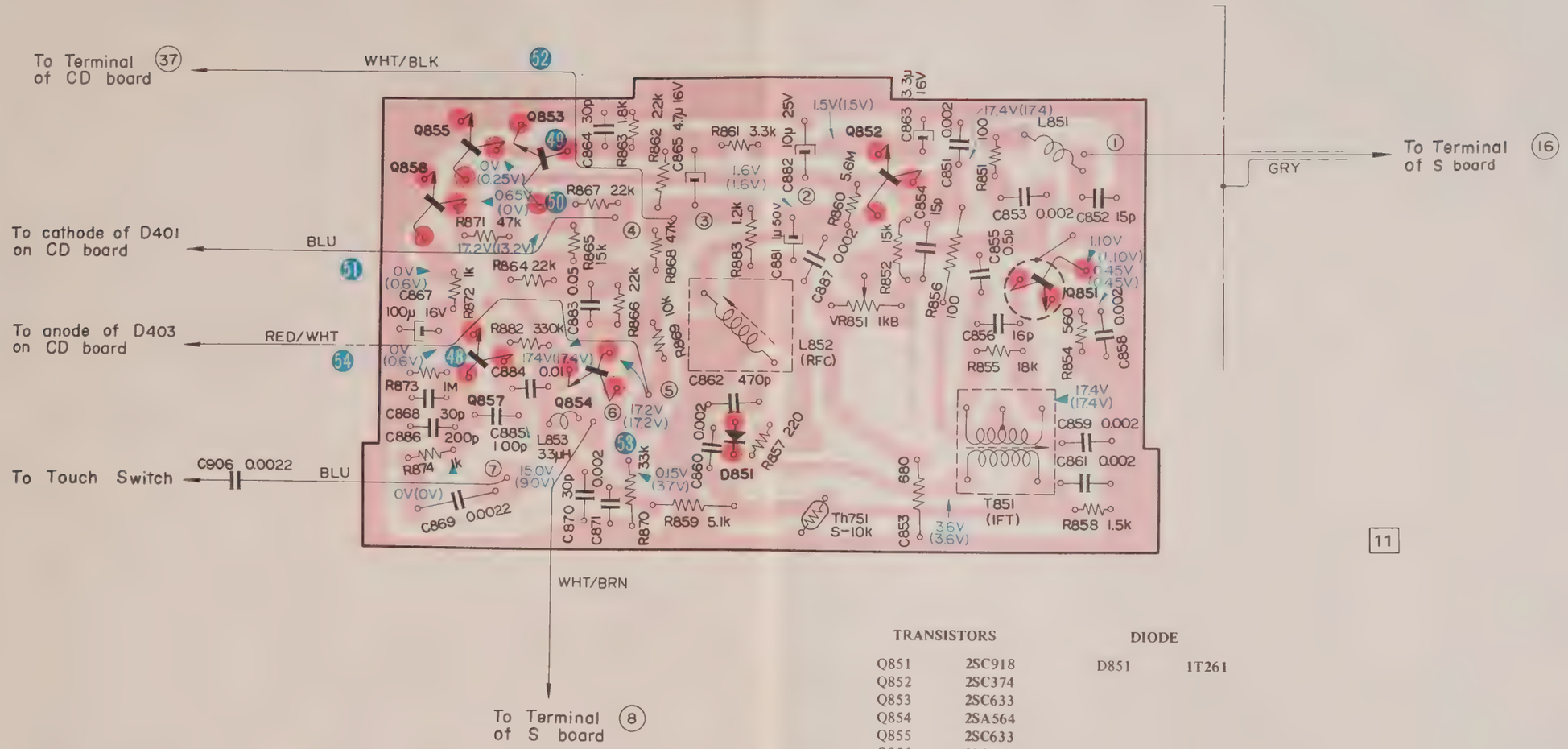
1. C270 is changed to 330 pF. (Serial No. 26,001 and later)
2. Q203 is changed to 2SC1128. (Serial No. 30,001 and later)
3. Q211 and Q212 are changed to 2SC403C. (Serial No. 30,001 and later)
4. CV201

Serial No. up to 34,000

Serial No. 34,001 and later

MOUNTING DIAGRAM

TI Circuit Board (for all chassis)



11

TRANSISTORS

Q851	2SC918
Q852	2SC374
Q853	2SC633
Q854	2SA564
Q855	2SC633
Q856	2SC633
Q857	2SC374

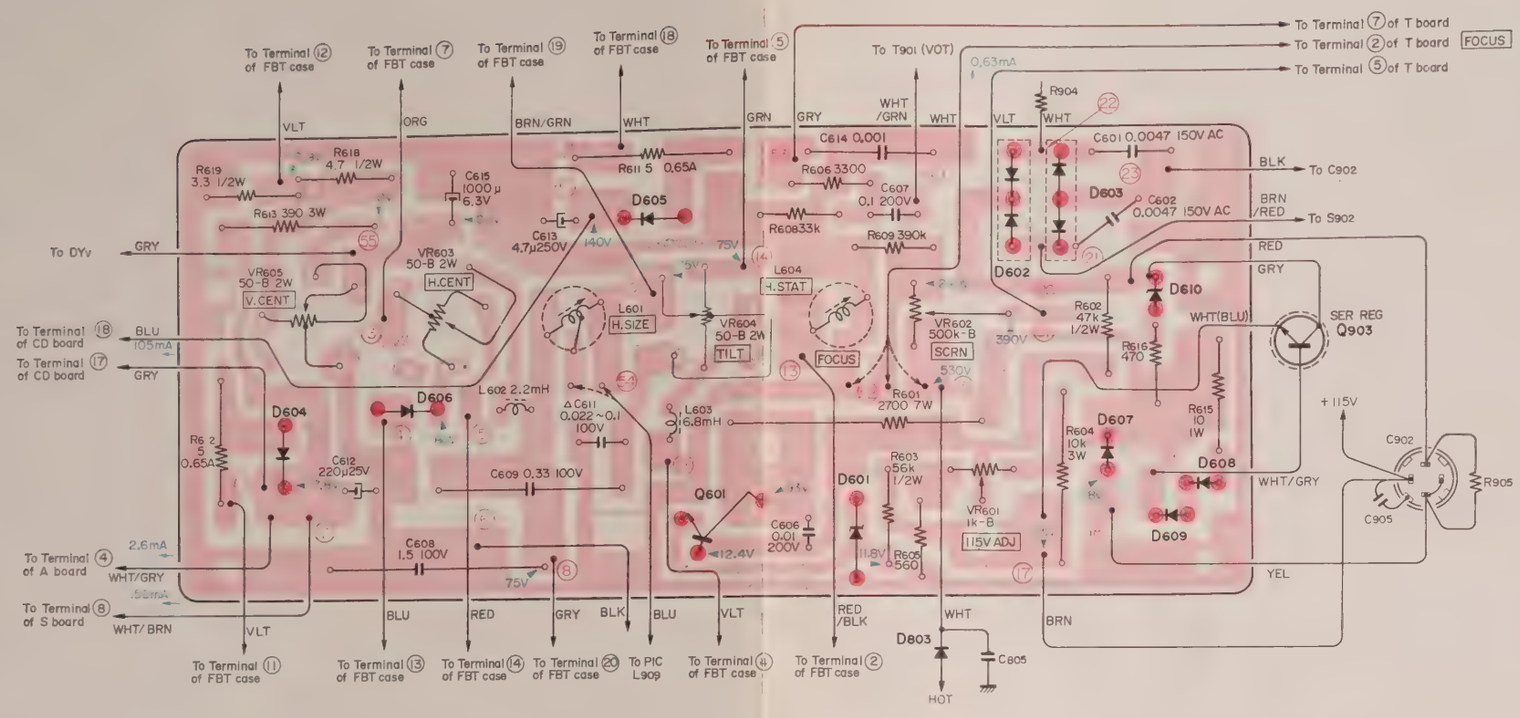
DIODE

D851	1T261

MOUNTING DIAGRAM

P Circuit Board

Applicable Serial No.:
Up to 30,000



13

TRANSISTORS

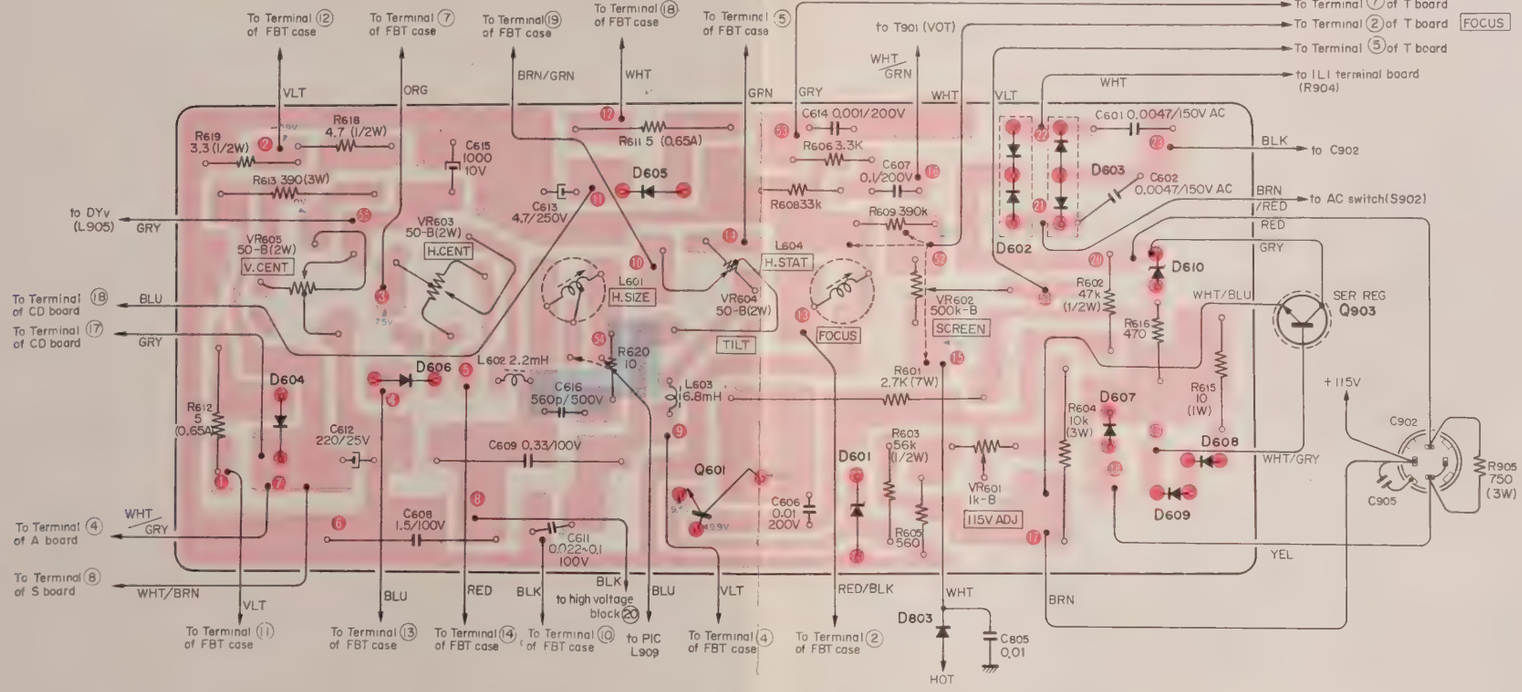
Q601	2SC867

DIODES

D601	ZB1-11
D602	CD-4
D603	CDR-4
D604	SB-2
D605	SB-2
D606	SB-2
D607	10D05
D608	10D05
D609	10D05
D610	1T263

P Circuit Board

Applicable Serial No.:
30,001 and later



Note:

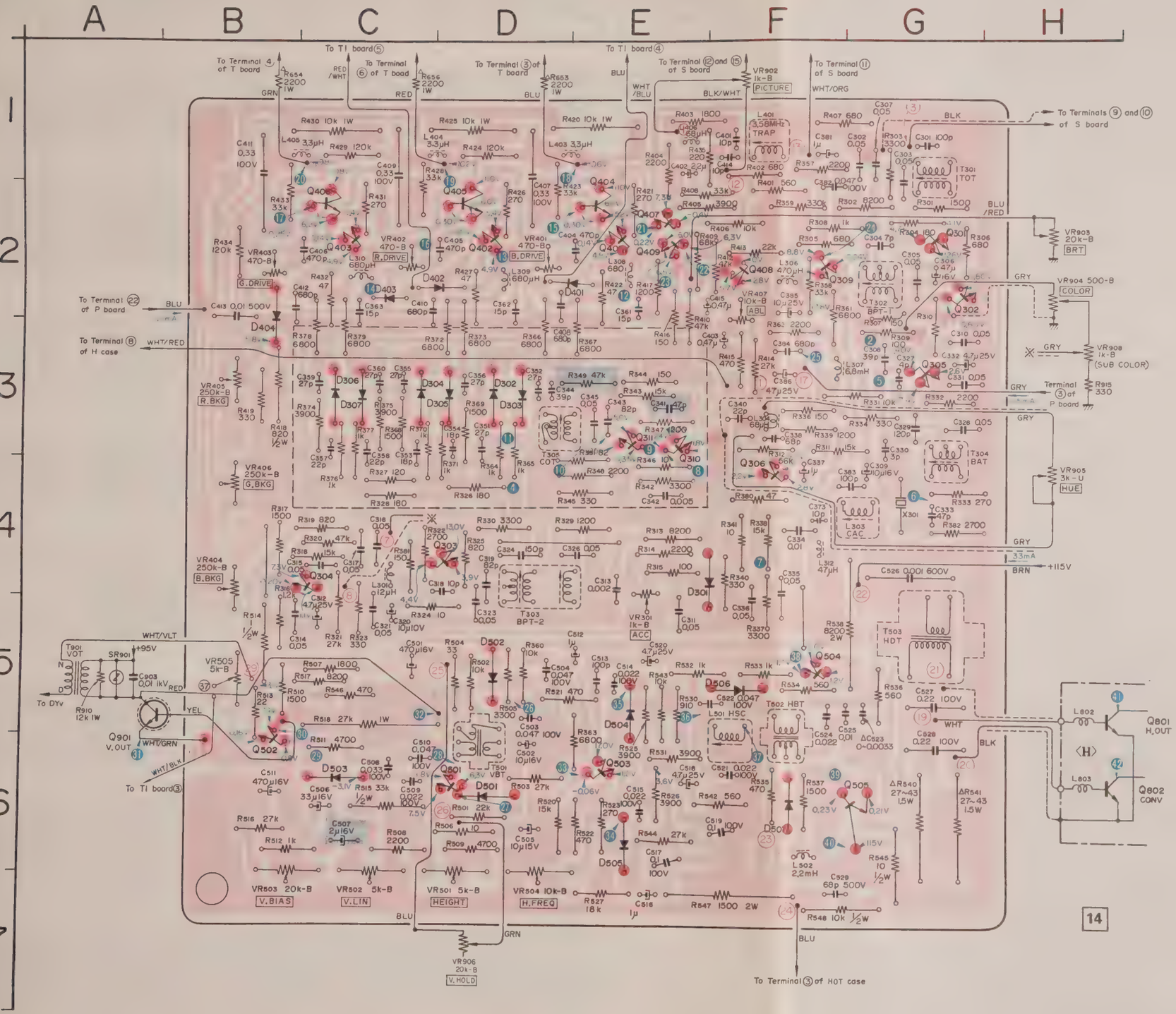
1. Printed circuit board is changed.
2. C616 and R620 marked with ▬ are added.

14

MOUNTING DIAGRAM

CD Circuit Board

Applicable Serial No.: Up to 26,000



TRANSISTORS

Q301	G-2	2SC403A
Q302	G-2	2SC633A
Q303	D-4	2SC710
Q304	C-4	2SC633A
Q305	G-3	2SC403A
Q306	F-4	2SC710
Q309	F-2	2SA610
Q310	E-3	2SC710
Q311	E-3	2SC403A
Q401	E-2	2SA610
Q402	D-2	2SA610
Q403	C-2	2SA610
Q404	E-2	2SC1056
Q405	D-2	2SC1056
Q406	C-2	2SC1056
Q407	E-2	2SC633A
Q408	F-2	2SC633A
Q409	E-2	2SC633A
Q501	D-6	2SC633A
Q502	B-6	2SC633A
Q503	E-6	2SC633A
Q504	F-5	2SC403A
Q505	G-6	2SC867

DIODES

D301	F-4	CD860011 or 1S2100
D302	D-3	CD860011 or 1S2100
D303	D-3	CD860011 or 1S2100
D304	C-3	CD860011 or 1S2100
D305	D-3	CD860011 or 1S2100
D306	C-3	CD860011 or 1S2100
D307	C-3	CD860011 or 1S2100
D401	E-2	CD860011 or 1S2100
D402	D-2	CD860011 or 1S2100
D403	C-2	CD860011 or 1S2100
D404	B-2	CD860011 or 1S2100
D501	D-6	CD860011 or 1S2100
D502	D-5	CD860011 or 1S2100
D503	C-6	1S1701
D504	E-5	1T22A
D505	E-6	1T22A
D506	F-5	1T22A
D507	F-6	1T22A

Note:

The parts marked with ▲ are changed;

C507 2μF → 2.2μF
(Serial No. 11,501 and later)

C341 47pF → 36pF
(Serial No. 24,001 and later)

R349 47kΩ → 33kΩ
(Serial No. 24,001 and later)

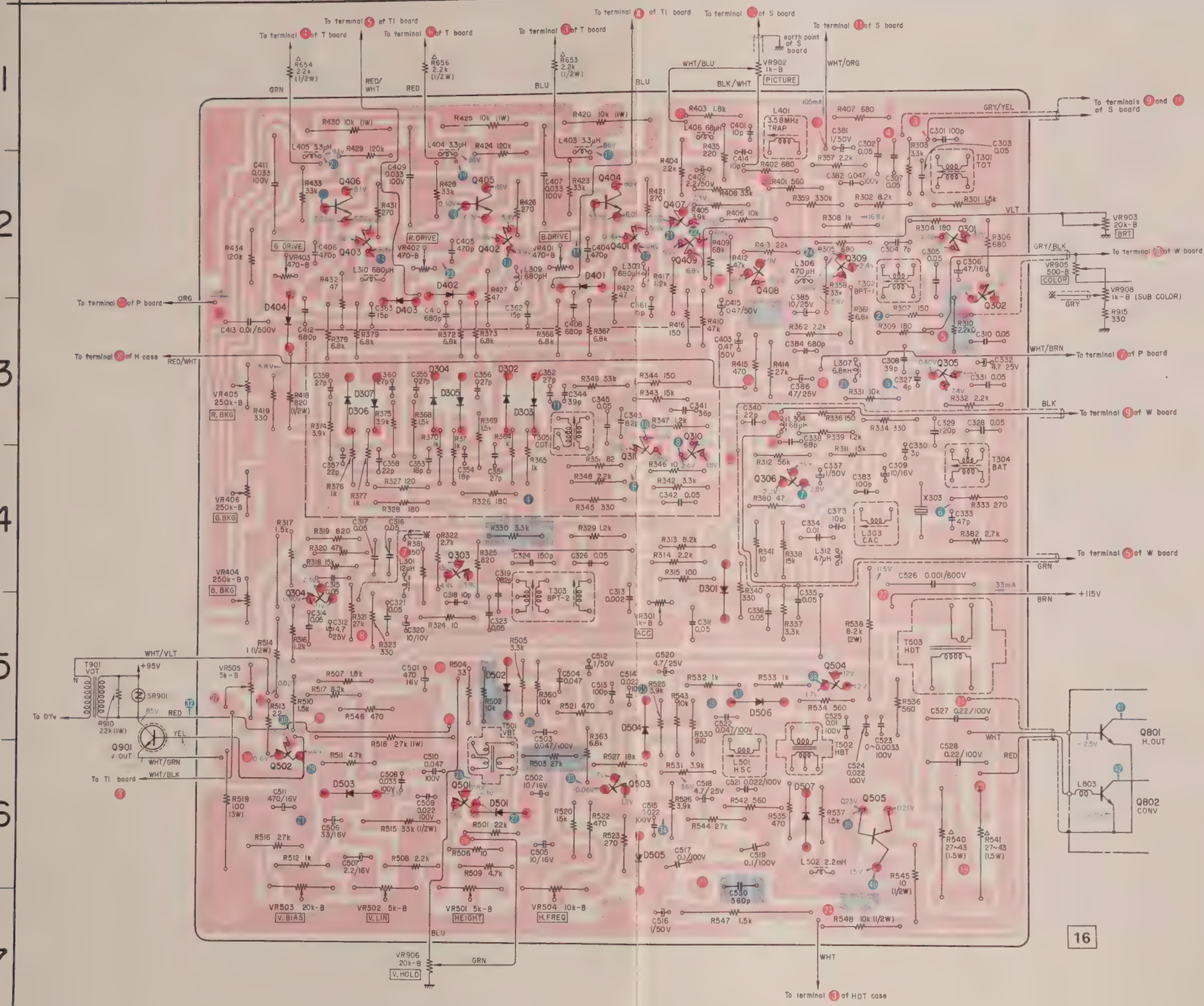
MOUNTING DIAGRAM

CD Circuit Board

Applicable Serial No.: 26,001 and later

DIODES

D301	E-5	1T40
D302	D-3	1T22
D303	D-3	1T22
D304	C-3	1T22
D305	D-3	1T22
D306	C-3	1T22
D307	C-3	1T22
D401	D-3	CD860011 or 1S2100
D402	C-3	CD860011 or 1S2100
D403	C-3	CD860011 or 1S2100
D404	B-3	CD860011 or 1S2100
D501	D-6	CD860011 or 1S2100
D502	D-5	CD860011 or 1S2100
D503	C-6	1S1701
D504	E-5	1T22A
D505	E-6	1T22A
D506	F-5	1T22A
D507	F-6	1T22A



TRANSISTORS

Q301	G-2	2SC403A
Q302	G-3	2SC633A
Q303	D-5	2SC710
Q304	C-5	2SC633A
Q305	G-3	2SC403A
Q306	F-4	2SC710
Q309	F-3	2SA564A
Q310	E-4	2SC710
Q311	E-4	2SC403A
Q401	E-2	2SA564A
Q402	D-2	2SA564A
Q403	C-2	2SA564A
Q404	E-2	2SC1056
Q405	D-2	2SC1056
Q406	C-2	2SC1056
Q407	E-2	2SC633A
Q408	F-3	2SC633A
Q409	E-2	2SC633A
Q501	D-6	2SC633A
Q502	B-6	2SC633A
Q503	E-6	2SC633A
Q504	F-5	2SC403A
Q505	F-6	2SC867

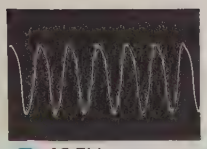
Note:

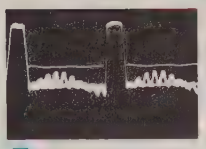
The parts marked ▲ are changed;

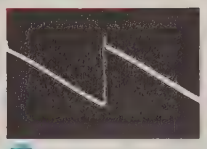
C529	discarded (Serial No. 26,001 and later)
C530	added 560pF (Serial No. 26,001 ~ 35,000)
VR407	discarded (Serial No. 26,001 and later)
R310	changed to 3.9 kΩ (Serial No. 30,001 and later)
R330	changed to 3.9 kΩ (Serial No. 30,001 and later)
R502	changed to 12 kΩ (Serial No. 30,001 and later)
R503	changed to 22 kΩ (Serial No. 30,001 and later)
Q404~ Q406	changed to 2SC1127 (Serial No. 30,001 and later)

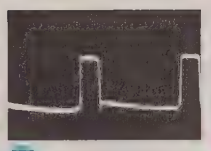
WAVEFORMS

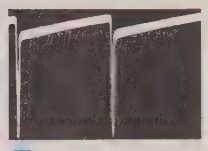
1 1.1Vp-p (Horiz.)

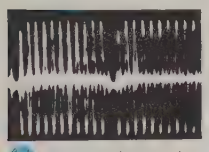

11 16.5Vp-p (3.58MHz)


20 42.0Vp-p (Horiz.)

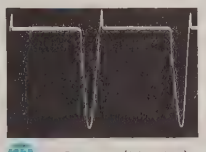

29 0.98Vp-p (Vert.)

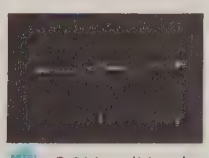

38 14.0Vp-p (Horiz.)

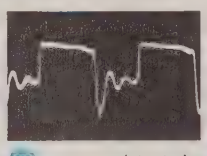

47 41.0Vp-p (Vert.)

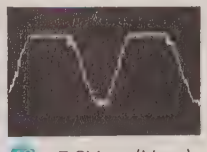

2 0.7Vp-p (Horiz.)

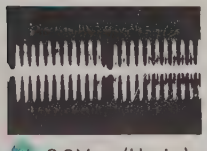
12 1.4Vp-p (Horiz.)

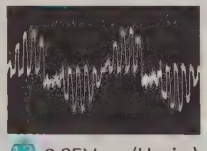

21 6.8Vp-p (Horiz.)

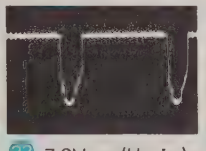

30 8.0Vp-p (Vert.)

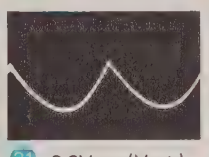

39 1.8Vp-p (Horiz.)

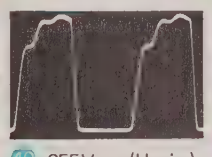

48 7.8Vp-p (Vert.)

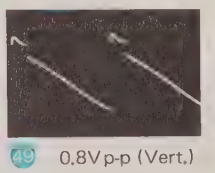

3 3.0Vp-p (Horiz.)

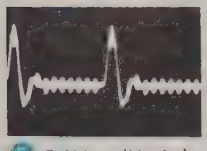

13 0.85Vp-p (Horiz.)

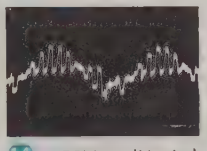

22 7.2Vp-p (Horiz.)

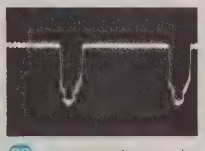

31 0.6Vp-p (Vert.)

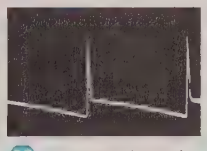

40 255Vp-p (Horiz.)

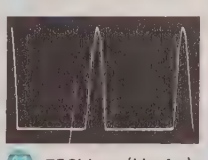

49 0.8Vp-p (Vert.)

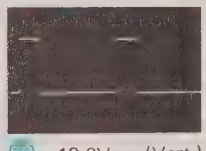

5 5.0Vp-p (Horiz.)

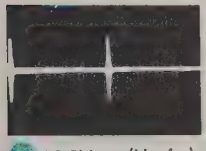

14 0.56Vp-p (Horiz.)

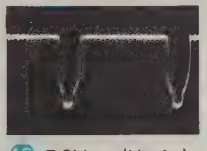

23 7.2Vp-p (Horiz.)

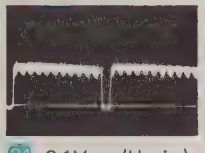

32 500Vp-p (Vert.)

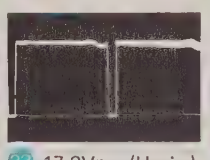

41 580Vp-p (Horiz.)

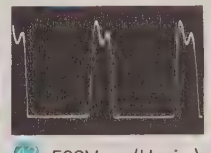

50 18.0Vp-p (Vert.)

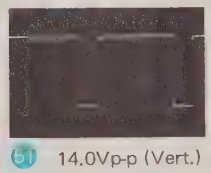

6 14.0Vp-p (Horiz.)

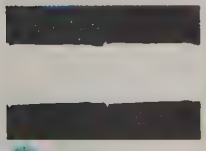

15 7.2Vp-p (Horiz.)


24 2.1Vp-p (Horiz.)

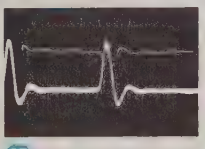

33 17.0Vp-p (Horiz.)


42 560Vp-p (Horiz.)

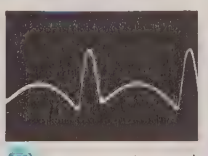

51 14.0Vp-p (Vert.)

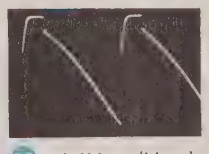

7 0.3Vp-p (Horiz.)

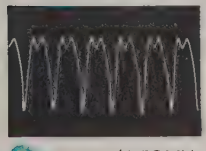
16 6.6Vp-p (Horiz.)

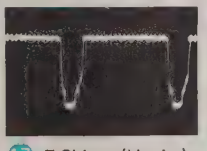

25 7.0Vp-p (Horiz.)

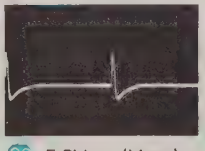
34 9.6Vp-p (Horiz.)

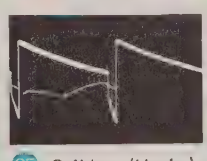

43 20.0Vp-p (Horiz.)

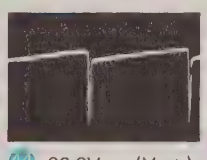

52 1.1Vp-p (Vert.)

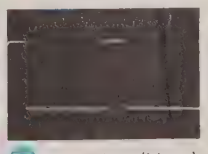

8 0.4Vp-p (3.58MHz)

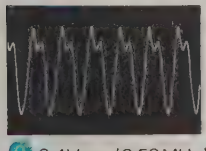

17 7.2Vp-p (Horiz.)

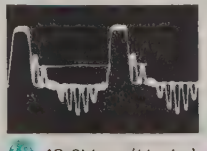

26 5.2Vp-p (Vert.)

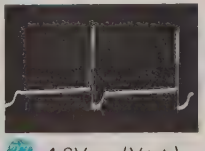

35 8.4Vp-p (Horiz.)

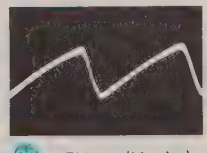

44 96.0Vp-p (Vert.)

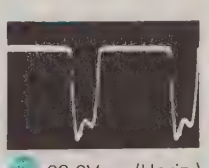

53 15.5Vp-p (Vert.)

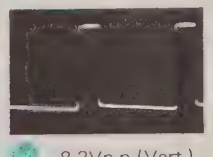

9 8.4Vp-p (3.58MHz)

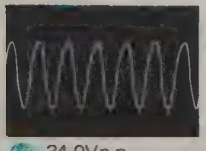

18 48.0Vp-p (Horiz.)

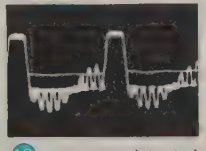

27 4.6Vp-p (Vert.)

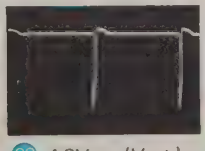

36 1.5Vp-p (Horiz.)

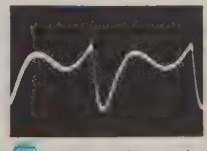

45 98.0Vp-p (Horiz.)

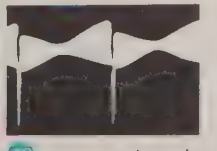

54 8.2Vp-p (Vert.)


10 34.0Vp-p (3.58MHz)


19 40.0Vp-p (Horiz.)

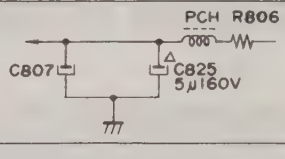
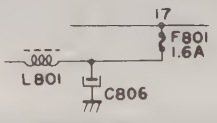
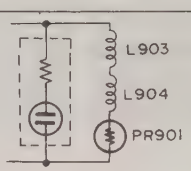
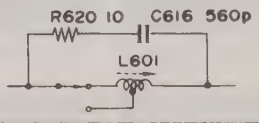
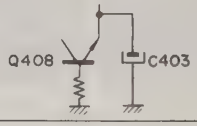
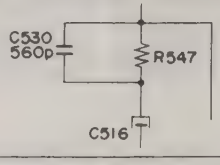
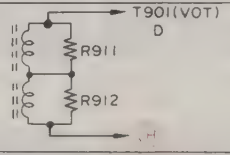

28 4.8Vp-p (Vert.)


37 1.8Vp-p (Horiz.)


46 64.0Vp-p (Vert.)

Note:
Vert.: 30 Hz
Horiz.: 7875 Hz

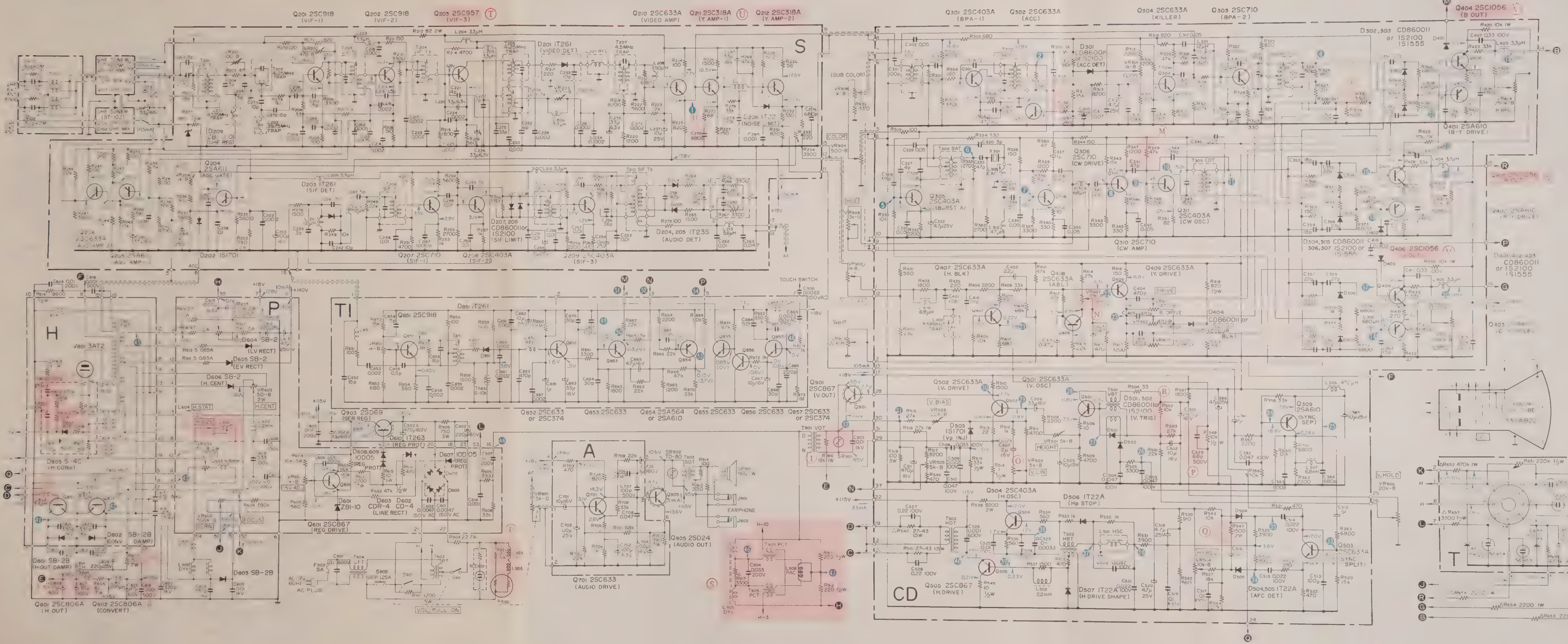
Detail of Circuit Change

Mark on Diagram	Description	Applicable Serial No.
(A)	C807 changed (40 μF 160 V) C808 omitted C825 added (5 μF 160 V) 	30,001 and later
(B)	C818 omitted	24,001 and later
(C)	F801 added (1.6 A) 	30,001 and later
(D)	R921 omitted PR901 changed 	30,001 and later
(E)	L802 omitted (short)	13,401 and later
(F)	C801 changed (0.01 μF 600 WV) C802 changed (250 pF 25 kV) R803 changed (1.2 kΩ)	32,301 and later
(G)	C616 added (560 pF 500 V) R620 added (10 Ω) 	30,001 and later
(H)	C270 changed (330 pF)	26,001 and later
(I)	C903 omitted R910 changed (22 kΩ)	30,001 and later
(J)	R310 changed (3.9 kΩ)	30,001 and later
(K)	R330 changed (3.9 kΩ)	30,001 and later
(M)	C341 changed (36 pF) R349 changed (33 kΩ)	24,001 and later 24,001 and later
(N)	VR407 omitted 	26,001 and later
(O)	C507 changed (2.2 μF)	11,501 and later
(P)	C529 omitted	26,001 and later
(Q)	C530 added (560 pF 500 WV) 	26,001 and later
R	R502 changed (12 kΩ) R503 changed (22 kΩ)	30,001 and later
S	R917 omitted C904 omitted T905, L908 omitted DY changed 	38,001 and later
T	Q203 changed (2SC1128)	30,001 and later
U	Q211, Q212 changed (2SC403C)	30,001 and later
V	Q404 ~ Q406 changed (2SC1127)	30,001 and later

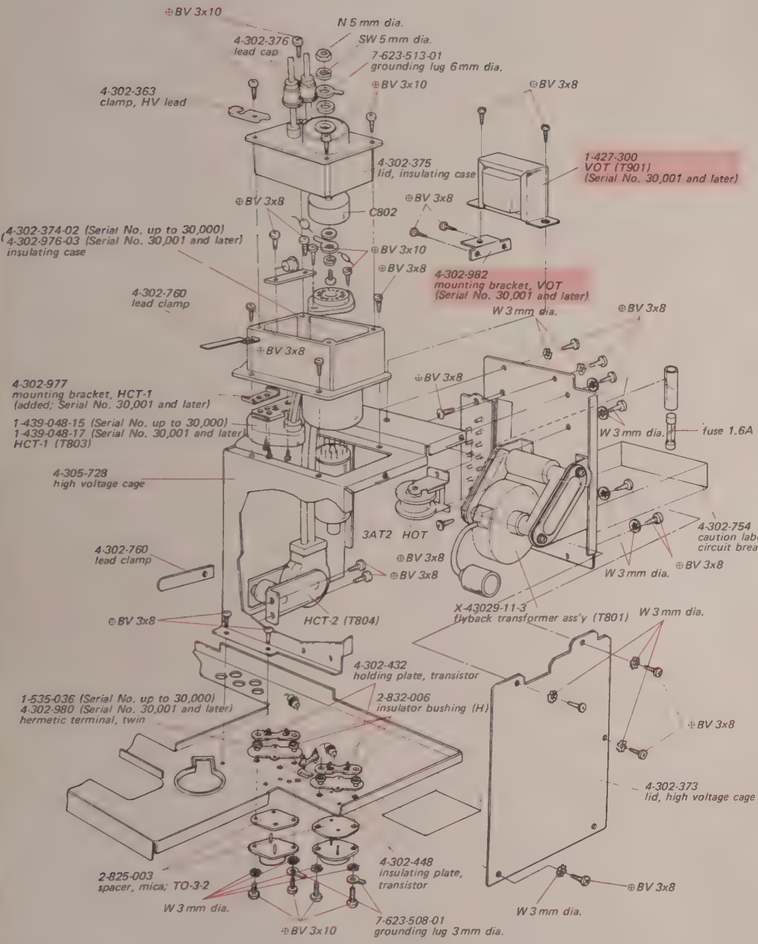
KV-1220U

SCHEMATIC DIAGRAM

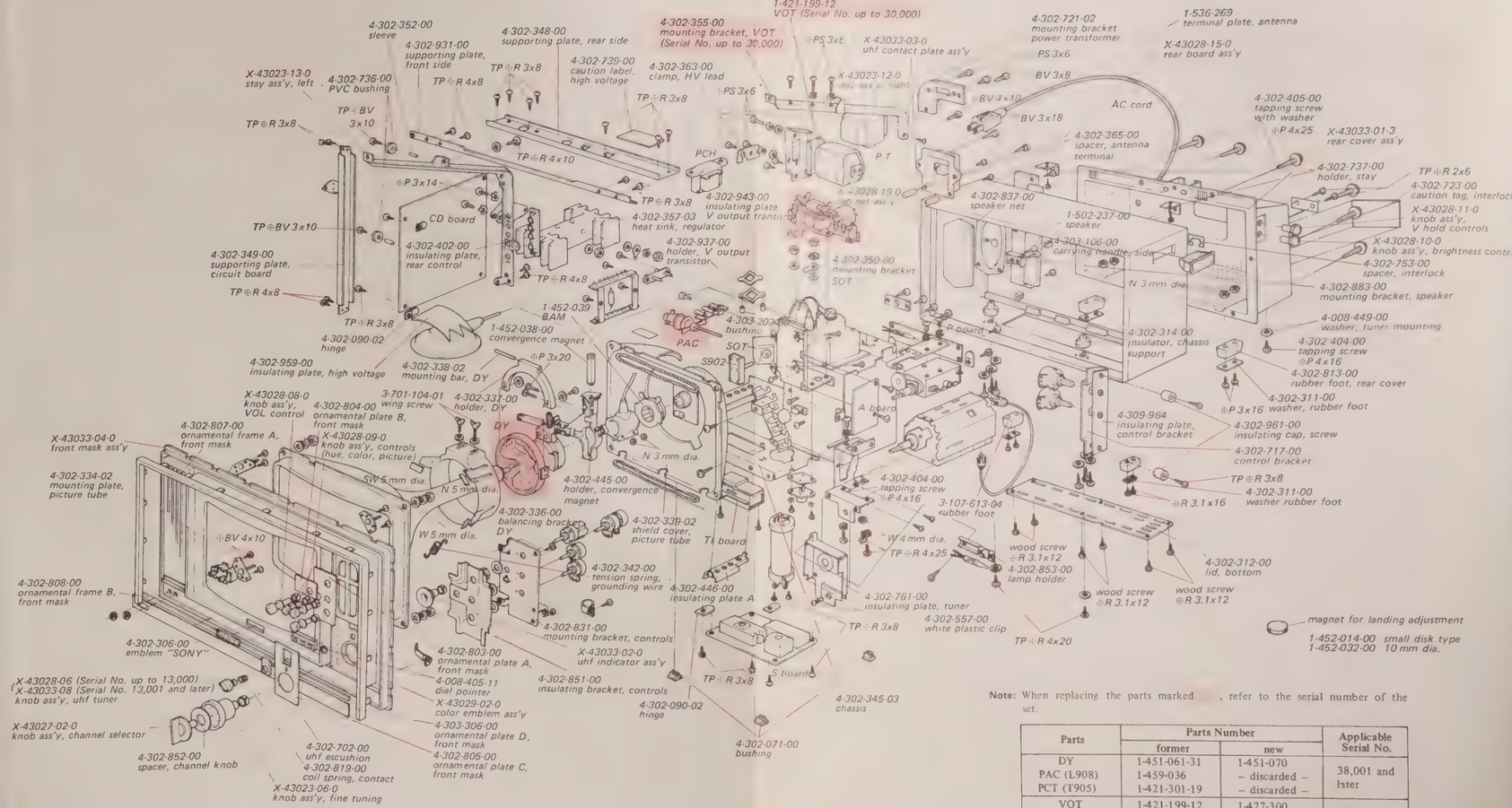
Chassis No. up to SCC-A04-CA


Q201 2SC918 (VIF-1)
Q202 2SC918 (VIF-2)
Q203 2SC957 (VIF-3)
Q210 2SC633A (VIDEO AMP)
Q211 2SC318A (Y. AMP-1)
Q212 2SC318A (Y. AMP-2)
S
Q301 2SC403A (BPA-1)
Q302 2SC633A (ACC)
Q304 2SC633A (KILLER)
Q303 2SC710 (BPA-2)
Q404 2SC1056 (B OUT)
D302, 303 CD860011 or 1S2100 1S1555
D301 CD860011 or 1S2100 (ACC DET)
D201 1T261 (VIDEO DET)
D209 (UHF REG)
UHF TUNER (BT-102)
Q204 2SA611 (AGC GATE)
D203 1T261 (SIF DET)
D207, 208 CD860011 or 1S2100 (SIF LIMIT)
D204, 205 1T23S (AUDIO DET)
D206 1T22 (NOISE LIMIT)
Q206 2SC633A AGC AMP-2
Q205 2SA611 AGC AMP-1
D202 1S1701
Q207 2SC710 (SIF-1)
Q208 2SC403A (SIF-2)
Q209 2SC403A (SIF-3)
Q305 2SC403A (BURST A)
Q306 2SC710 (CW DRIVE)
Q310 2SC710 (CW AMP)
Q311 2SC403A (CW OSC)
Q401 2SA610 (B-Y DRIVE)
D304, 305, 306, 307 CD860011 or 1S2100 or 1S1555
Q406 2SC1056 (G OUT)
D401, 402, 403 CD860011 or 1S2100 1S1555
Q407 2SC633A (H. BLK)
Q408 2SC633A (ABL)
Q409 2SC633A (Y. DRIVE)
D404 CD860011 or 1S2100 (COLOR BLK)
H
V801 3AT2
D805 S-4C (H CONV)
D802 SB-12B (CONV)
SB-12B (DAMP)
D801 SB-2B (H OUT DAMP)
Q801 2SC806A (H OUT)
Q802 2SC806A (CONVERT)
P
D604 SB-2 (LV RECT)
D605 SB-2 (EV RECT)
D606 SB-2 (H. CENT)
VR603 50-B 2W H.CENT
D803 SB-2B
TI
D851 1T261
Q851 2SC918
Q852 2SC633 or 2SC374
Q853 2SC633
Q854 2SA564 or 2SA610
Q855 2SC633
Q856 2SC633
Q857 2SC633 or 2SC374
TOUCH SWITCH
Q903 2SD69 (SER REG)
D610 1T263 (REG PROT)
D608, 609 10D05 (REG PROT)
D607 10D05 (REG PROT)
D601 ZB1-10
D603 CDR-4 (LINE RECT)
D602 CD-4
Q601 2SC867 (REG DRIVE)
A
Q701 2SC633 (AUDIO DRIVE)
Q905 2SD24 (AUDIO OUT)
EARPHONE
VOL PULL ON
AC PLUG
Q901 2SC867 (V.OUT)
T901 VOT
Q502 2SC633A (V. DRIVE)
Q501 2SC633A (V. OSC)
D501, 502 CD860011 or 1S2100 (V. TRIG)
D503 1S1701 (Vp INJ)
V.BIAS
HEIGHT
V.LIN
Q309 2SA610 (SYNC SEP)
V.HOLD
Q504 2SC403A (H.OSC)
D506 1T22A (Hp STOP)
CD
Q505 2SC867 (H.DRIVE)
D507 1T22A (H DRIVE SHAPE)
D504, 505 1T22A (AFC DET)
Q503 2SC633A (SYNC SPLIT)
T

EXPLODED VIEW



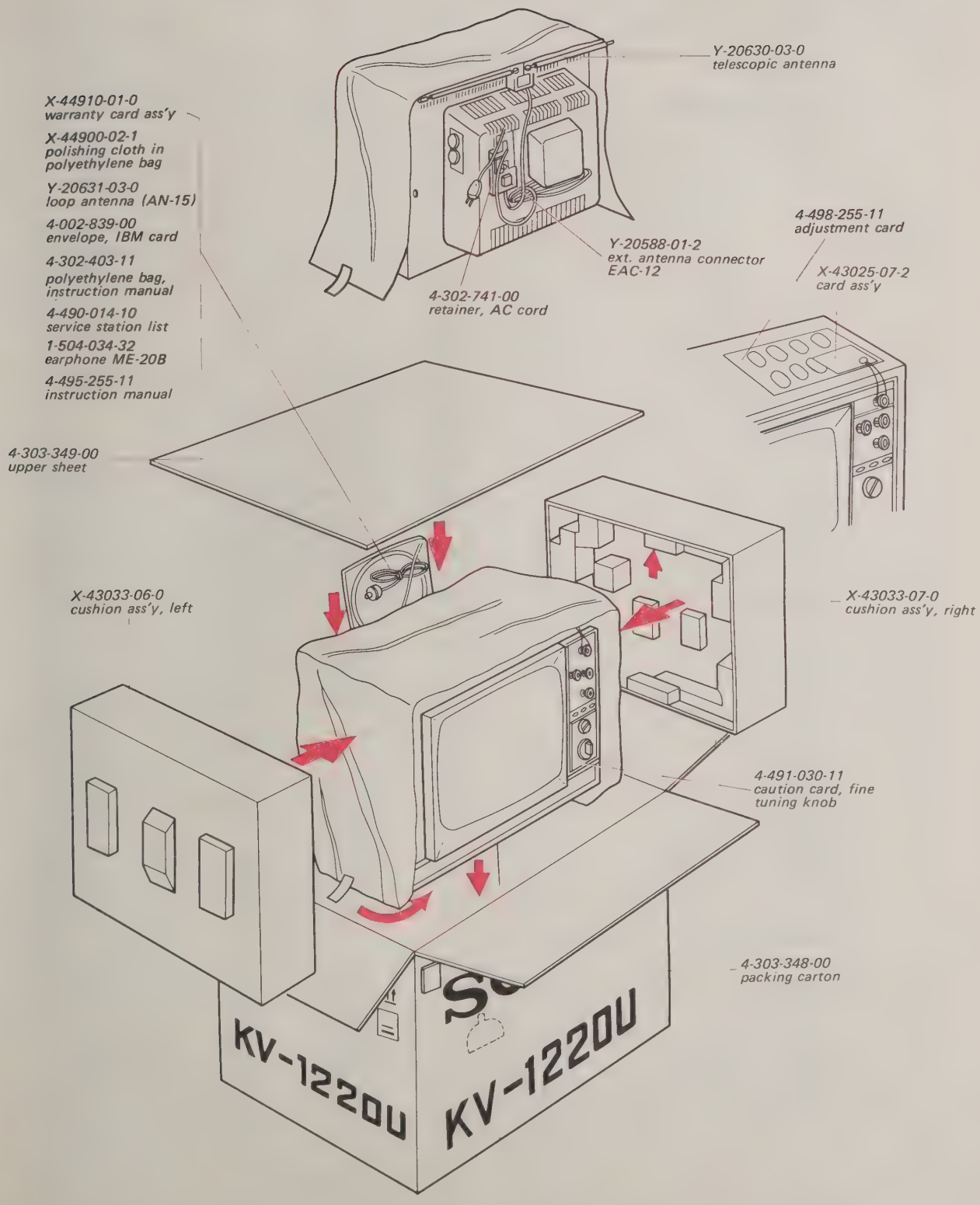
EXPLODED VIEW



Note: When replacing the parts marked , refer to the serial number of the set.

Parts	Parts Number		Applicable Serial No.
	former	new	
DY	1-451-061-31	1-451-070	38,001 and later
PAC (L908)	1-459-036	– discarded –	
PCT (T905)	1-421-301-19	– discarded –	
VOT	1-421-199-12	1-427-300	30,001 and later
mounting bracket, VOT	4-302-355	4-302-982	

PACKING


X-44910-01-0
warranty card ass'y
X-44900-02-1
polishing cloth in polyethylene bag
Y-20631-03-0
loop antenna (AN-15)
4-002-839-00
envelope, IBM card
4-302-403-11
polyethylene bag, instruction manual
4-490-014-10
service station list
1-504-034-32
earphone ME-20B
4-495-255-11
instruction manual
Y-20630-03-0
telescopic antenna
Y-20588-01-2
ext. antenna connector EAC-12
4-302-741-00
retainer, AC cord
4-498-255-11
adjustment card
X-43025-07-2
card ass'y
4-303-349-00
upper sheet
X-43033-06-0
cushion ass'y, left
X-43033-07-0
cushion ass'y, right
4-491-030-11
caution card, fine tuning knob
4-303-348-00
packing carton
KV-1220U
KV-1220U

TUNER ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
		Semiconductors
Q1		SE5020
Q2		SE5021
Q3		SE3001
Q01		2SC387 or 2SC684
D01		M8482 or SD82A
		Capacitors
C1	CD60SL270K	27 pF, Disc Capacitor
C2	CD60SL270K	27 pF, "
C3	CD60SL270K	27 pF, "
C4	CD60SL270K	27 pF, "
C5	CC603SL820K	82 pF, "
C6	CF18SL270K	27 pF, Feed Through
C7	CC601SL8RZD	82 pF, Disc Capacitor
C8	CC602YZ102P	1000 pF, "
C9	CC602SL300K	30 pF, "
C10	CC602CH080D	1000 pF, "
C12	CF11Y5R102P	1000 pF, Feed Through
C13	CC601SL010C	1 pF, Disc Capacitor
C14	CF11Y5R102P	1000 pF, Feed Through
C15	CC60SL390K	39 pF, Disc Capacitor
C16	CC60SL030C	3 pF, "
C17	CC602SL300K	30 pF, "
C18	CC601SL070D	7 pF, "
C19	CF11AJ010C	1 pF, Feed Through
C20	CF11Y5R102P	1000 pF, "
C21	CF11SL470K	47 pF, "
C22	CF11Y5R102P	1000 pF, "
C23	CF11Y5R102P	1000 pF, "
C24	CC60SL150K	15 pF, Disc Capacitor
C25	CC60SL050C	5 pF, "
C26	CF11SL330K	33 pF, Feed Through
C27	CF11AJ010C	1 pF, "
C28	CC602CH080D	8 pF, Disc Capacitor
C29	CF11AJ010C	1 pF, Feed Through
C30	CC601RG020C	2 pF, Disc Capacitor
C31	CC601SL0R5S	0.5-2 pF, "
C32	CF18Y5R102P	1000 pF, Feed Through
C33	CC601SH030C	3 pF, Disc Capacitor
C34	CC601SH060D	6 pF, Disc Capacitor
C35	CF11Y5R102P	1000 pF, Feed Through
C36	CF11AJ010C	1 pF, "
C37	CC601SH010C	1 pF, Disc Capacitor
C38	CF11SL100K	10 pF, Feed Through
C39	CF11SL300K	30 pF, "
C40	CF11SL100K	10 pF, "
C41	CC601SL070D	7 pF, Disc Capacitor
C42	CC602YZ102P	1000 pF, "
		Resistors
R1	RS1/8Y222K	2.2 kΩ, Carbon Resistor
R2	RS1/8Y221K	200 Ω, "
R3	RS1/8Y500K	50 Ω, "
R4	RS1/8Y681K	680 Ω, "
R5	RS1/8Y222K	2.2 kΩ, "
R6	RS1/8Y362K	3.6 kΩ, "
R7	RS1/8Y102K	1 kΩ, "
R9	RS1/8Y182K	1.8 kΩ, "
R10	RS1/8Y103K	10 kΩ, "
R11	RS1/8Y103K	10 kΩ, "
R12	RS1/8Y562K	5.6 kΩ, "
R13	RS1/8Y471K	470 Ω, "
R14	RS1/8Y102K	1 kΩ, "
VR1	EZ129	680 Ω, Variable Resistor
		Chokes and Coils
L1	UW04035R	IF Trap Coil
L2	UW04035R	"
L3	UW04035R	"
L4	LFR040	FM Trap Coil
L5	AD03545R	UHF IF Input Coil
L6		LEAD WIRE OF C9 ℓ = 8 mm
		VHF Input Coil
L7	AD03543R	UHF IF Input Coil
L8	UW05020R	OSC Aux Coil
L9	UW05040L	VHF CH5 Trap Coil
RFC1	FL3H2R4K	2.4 MHz RF Choke Coil
RFC2	FL3H2R4K	2.4 MHz FL3H2R4K
IFT		43.5 MHz IFT

ELECTRICAL PARTS LIST

Note: The mark ★ indicates changed parts. The component marked ★ are necessary to change from certain serial no. of the set. New parts number and description are described on page 76.

Ref.No.	Part No.	Description
		SEMICONDUCTORS
Q201		transistor 2SC918
Q202		transistor 2SC918
Q203		transistor 2SC957 or 2SC1128
Q204		transistor 2SA611
Q205		transistor 2SA611
Q206		transistor 2SC633A
Q207		transistor 2SC710
Q208		transistor 2SC403A
Q209		transistor 2SC403A
Q210		transistor 2SC633A
Q211		transistor 2SC318A or 2SC403C
Q212		transistor 2SC318A or 2SC403C
Q301		transistor 2SC403A
Q302		transistor 2SC633A
Q303		transistor 2SC710
Q304		transistor 2SC633A
Q305		transistor 2SC403A
Q306		transistor 2SC710
Q307		– discarded –
Q308		– discarded –
Q309		transistor 2SA610
Q310		transistor 2SC710
Q311		transistor 2SC403A
Q401		transistor 2SA610
Q402		transistor 2SA610
Q403		transistor 2SA610
Q404		transistor 2SC1056 or 2SC1127
Q405		transistor 2SC1056 or 2SC1127
Q406		transistor 2SC1056 or 2SC1127
Q407		transistor 2SC633A
Q408		transistor 2SC633A
Q409		transistor 2SC633A
Q501		transistor 2SC633A
Q502		transistor 2SC633A
Q503		transistor 2SC633A
Q504		transistor 2SC403A
Q505		transistor 2SC867
Q601		transistor 2SC867
Q701		transistor 2SC633
Q801		transistor 2SC806A
Q802		transistor 2SC806A
Q851		transistor 2SC918
Q852		transistor 2SC374
Q853		transistor 2SC633
Q854		transistor 2SA564
Q855		transistor 2SC633
Q856		transistor 2SC633
Q857		transistor 2SC374
Q901		transistor 2SC867
Q902		– discarded –
Q903		transistor 2SD69
Q904		– discarded –
Q905		transistor 2SD24
D201		diode 1T261
D202		diode 1S1701
D203		diode 1T261
D204		diode 1T23S
D205		diode 1T23S
D206		diode 1T22
D207		diode CD860011 or 1S2100
D208		diode CD860011 or 1S2100
D209		diode ZB1-11
D301		diode CD860011 or 1S2100
D302		diode CD860011 or 1S2100
D303		diode CD860011 or 1S2100
D304		diode CD860011 or 1S2100
D305		diode CD860011 or 1S2100
D306		diode CD860011 or 1S2100
D307		diode CD860011 or 1S2100
D401		diode CD860011 or 1S2100
D402		diode CD860011 or 1S2100
D403		diode CD860011 or 1S2100
D404		diode CD860011 or 1S2100
D501		diode CD860011 or 1S2100
D502		diode CD860011 or 1S2100
D503		diode 1S1701
D504		diode 1T22(A)
D505		diode 1T22(A)
D506		diode 1T22(A)
D507		diode 1T22(A)
D601		diode ZB1-11
D602		diode CD-4
D603		diode CDR-4
D604		diode SB-2
D605		diode SB-2
D606		diode SB-2
D607		diode 10D05
D608		diode 10D05
D609		diode 10D05
D610		diode 1T263
D801		diode SB-2B
D802		diode SB-2B
D803		diode SB-2B

Ref.No.	Part No.	Description
D804		– discarded –
D805		diode S-4C
D851		diode 1T261
Th201	1-800-059-00	thermistor 200Ω
Th851	8-690-001-00	thermistor S-10K

COILS

L201	1-409-176	47.25 MHz, coil wave trap
L202	1-409-178	39.75 MHz, coil wave trap
L203	1-407-184	3.3μH, micro inductor
L204	1-407-184	3.3μH, micro inductor
L205	1-407-184	3.3μH, micro inductor
L206	1-407-184	3.3μH, micro inductor
L207	1-425-504	coil, RFC
L208	1-407-171	150μH, micro inductor
L209	1-407-184	3.3μH, micro inductor
L210	1-407-158	12μH, micro inductor
L211	1-407-158	12μH, micro inductor
L212	1-407-184	3.3μH, micro inductor
L213	1-407-187	5.6μH, micro inductor
L301	1-407-158	12μH, micro inductor
L302		– discarded –
L303	1-407-442	coil, crystal resonant frequency adjustment (CAC)
L304	1-407-167	68μH, micro inductor
L305		– discarded –
L306	1-407-177	470μH, micro inductor
L307	1-407-363	6.8 mH, micro inductor
L308	1-407-193	680μH, micro inductor
L309	1-407-193	680μH, micro inductor
L310	1-407-193	680μH, micro inductor
L311	1-407-364	3.3μH, coil, spook choke
L312	1-407-117	4.7μH, micro inductor
L401	1-409-193	3.58 MHz, coil, wave trap
L402	1-407-174	270μH, micro inductor
L403	1-407-364	3.3μH, coil, spook choke
L404	1-407-364	3.3μH, coil, spook choke
L405	1-407-364	3.3μH, coil, spook choke
L406	1-407-167	68μH, micro inductor
L501	1-413-005	coil, horizontal stabilized, HSC
L502	1-407-198	2.2 mH, micro inductor
L601	1-459-050	20 ~ 160μH, coil, horizontal stat
L602	1-407-198	2.2 mH, micro inductor
L603	1-407-363	6.8 mH, micro inductor
L604	1-459-034	50 ~ 60μH, coil, horizontal size
L801	1-407-346	200 μH, coil, spook choke
L802	1-407-364	3.3 μH, coil, spook choke
L803	1-407-364	3.3 μH, coil, spook choke
L804	1-407-443	coil, convergence improve
L851	1-407-404	RFC
L852	1-452-504	RFC
L853	1-407-184	3.3μH, micro inductor
L901	1-421-200	600 mH, coil, pincushion choke, PCH
L902		– discarded –
L903	1-425-512	coil, degaussing
L904	1-425-512	coil, degaussing
★ L905) ★ L906	1-451-061-31	deflection yoke
L907		– discarded –
★ L908	1-459-036	coil, pincushion adjustment; PAC

TRANSFORMERS

T201	1-403-504	VIFT-1
T202	1-409-177	41.25 MHz, coil, wave trap
T203	1-403-486	VIFT-2
T204	1-403-486	VIFT-3
T205	1-409-174	41.25 MHz, coil, wave trap
T206	1-403-524	VIFT-4
T207	1-409-146	4.5 MHz, coil, wave trap
T208	1-403-350	SIFT-1
T209	1-403-367	SIFT-2
T210	1-403-313	SIFT-3
T301	1-425-510	transformer, take off, TOT
T302	1-425-619	transformer, 1st band pass, BPT-1
T303	1-425-506	transformer, 2nd band pass, BPT-2
T304	1-405-372-21	transformer, burst amp, BAT
T305	1-425-618	transformer, cw oscillator, COT
T501	1-435-008	transformer, vertical blocking, VBT
T502	1-435-034	transformer, horizontal blocking, HBT
T503	1-437-025	transformer, horizontal drive, HDT
T801	X-43029-11	transformer, ass'y, flyback
	1-439-072	transformer, horizontal output
	1-439-076	transformer, flyback
T803	1-439-048-15	H.C-T-1
T804	1-439-049-13	H.C-T-2
T851	1-403-546	transformer, IF
★ T901	1-421-199-12	transformer, vertical output
T902	1-441-476	transformer, power
T904	1-421-302-12	coil, line choke
★ T905	1-421-301-19	transformer, pincushion; PCT

CAPACITORS

C103	1-121-471	10μF $\pm^{100}_{10}$% 16WV, electrolytic

Ref.No.	Part No.	Description
C104	1-121-403	33μF +100 −10% 16WV, electrolytic
C201	1-102-862	3 pF ±0.5 pF 50WV, ceramic
C202	1-101-002	0.002μF +100 −0% 50WV, ceramic
C203	1-121-415	100μF +100 −10% 16WV, electrolytic
C204	1-102-856	5pF ± 5% 50WV, ceramic
C205	1-102-856	5pF ± 5% 50WV, ceramic
C206		– discarded –
C207		– discarded –
C208	1-101-002	0.002μF +100 −0% 50WV, ceramic
C209	1-101-002	0.002μF +100 −0% 50WV, ceramic
C210	1-101-576	1.5 pF ±0.25 pF 25WV, ceramic
C211		– discarded –
C212	1-101-002	0.002μF +100 −0% 50WV, ceramic
C213	1-101-058	0.005μF +100 −0% 50WV, ceramic
C214	1-101-002	0.002μF +100 −0% 50WV, ceramic
C215	1-101-576	1.5pF ±0.25pF 25WV, ceramic
C216	1-101-002	0.002μF +100 −0% 50WV, ceramic
C217	1-101-002	0.002μF +100 −0% 50WV, ceramic
C218	1-101-002	0.002μF +100 −0% 50WV, ceramic
C219		– discarded –
C220	1-121-402	33μF +100 −10% 10WV, electrolytic
C221	1-101-954	4pF ±0.5pF 50WV, ceramic
C222		– discarded –
C223	1-101-002	0.002μF +100 −0% 50WV, ceramic
C224	1-101-002	0.002μF +100 −0% 50WV, ceramic
C225	1-101-002	0.002μF +100 −0% 50WV, ceramic
C226	1-121-402	33μF +100 −10% 10WV, electrolytic
C227	1-102-662	7pF ±0.5pF 50WV, ceramic
C228	1-101-002	0.002μF +100 −0% 50WV, ceramic
C229	1-101-953	3pF ±0.5pF 50WV, ceramic
C230	1-101-002	0.002μF +100 −0% 50WV, ceramic
C231		– discarded –
C232	1-102-857	6pF ±5pF 50WV, ceramic
C233	1-101-959	10pF ± 5% 5WV, ceramic
C234	1-101-002	0.002μF +100 −0% 5WV, ceramic
C235	1-121-402	33μF +100 −10% 10WV, electrolytic
C236		– discarded –
C237	1-121-398	10μF +100 −10% 25WV, electrolytic
C238	1-105-685-12	0.1μF ±10% 50WV, mylar
C239	1-101-004	0.01μF +100 −0% 50WV, ceramic
C240	1-121-403	33μF +100 −10% 16WV, electrolytic
C241	1-101-953	3pF ±0.5pF 50WV, ceramic
C242	1-101-959	10pF ± 5% 50WV, ceramic
C243	1-101-955	5pF ±0.5pF 50WV, ceramic
C244	1-121-398	10μF +100 −10% 25WV, electrolytic
C245		– discarded –
C246	1-101-004	0.01μF +100 −0% 50WV, ceramic
C247	1-101-455	1,000pF ±20% 50WV, ceramic
C248	1-101-004	0.01μF +100 −0% 50WV, ceramic
C249	1-101-953	3pF ±0.5pF 50WV, ceramic
C250	1-101-004	0.01μF +100 −0% 50WV, ceramic
C251	1-101-004	0.01μF +100 −0% 50WV, ceramic
C252		– discarded –

Ref.No.	Part No.	Description
C253	1-101-004	0.01μF +100 −0% 50WV, ceramic
C254	1-121-398	10μF +100 −10% 25WV, electrolytic
C255	1-102-809	7pF ±1pF 50WV, ceramic
C256	1-102-890	36pF ± 5% 50WV, ceramic
C257	1-101-004	0.01μF +100 −0% 50WV, ceramic
C258	1-101-571	140pF ± 5% 50WV, ceramic
C259	1-121-398	10μF +100 −10% 25WV, electrolytic
C260		– discarded –
C261		– discarded –
C262	1-101-004	0.01μF +100 −0% 50WV, ceramic
C263	1-105-681-12	0.047μF ±10% 50WV, mylar
C264	1-121-398	10μF +100 −10% 25WV, electrolytic
C265	1-121-403	33μF +100 −10% 16WV, electrolytic
C266	1-101-002	0.002μF +100 −0% 50WV, ceramic
C267	1-102-074	1,000pF ±10% 50WV, ceramic
C268	1-101-004	0.01μF +100 −0% 50WV, ceramic
C269	1-101-058	0.005μF ±20% 50WV, ceramic
★C270	1-102-116	680pF ±10% 50WV, ceramic
C271	1-101-002	0.002μF +100 −0% 50WV, ceramic
C272	1-102-858	10pF ± 5% 50WV, ceramic
C273	1-102-858	10pF ± 5% 50WV, ceramic
C274		– discarded –
C275	1-101-872	33pF ± 5% 50WV, ceramic
C276	1-102-116	680pF ±10% 50WV, ceramic
C277		– discarded –
C278		– discarded –
C279	1-101-004	0.01μF +100 −0% 50WV, ceramic
C280	1-105-661-12	0.001μF ±10% 50WV, mylar
C281	1-101-002	0.002μF +100 −0% 50WV, ceramic
C301	1-101-896	100pF ± 5% 50WV, ceramic
C302	1-101-007	0.05μF +100 −0% 50WV, ceramic
C303	1-101-007	0.05μF +100 −0% 50WV, ceramic
C304	1-102-944	7pF ±0.5pF 50WV, ceramic
C305	1-101-007	0.05μF +100 −0% 50WV, ceramic
C306	1-121-409	47μF +100 −10% 16WV, electrolytic
C307		– discarded –
C308	1-101-877	39pF ±10% 50WV, ceramic
C309	1-121-397	10μF +100 −10% 16WV, electrolytic
C310	1-101-007	0.05μF +100 −0% 50WV, ceramic
C311	1-101-007	0.05μF +100 −0% 50WV, ceramic
C312	1-121-395	4.7μF +150 −10% 25WV, electrolytic
C313	1-101-002	0.002μF +100 −0% 50WV, ceramic
C314	1-101-007	0.05μF +100 −0% 50WV, ceramic
C315	1-101-007	0.05μF +100 −0% 50WV, ceramic
C316	1-101-007	0.05μF +100 −0% 50WV, ceramic
C317	1-101-007	0.05μF +100 −0% 50WV, ceramic
C318	1-101-959	10pF ± 5% 50WV, ceramic
C319	1-102-863	82pF ± 5% 50WV, ceramic
C320	1-121-397	10μF +100 −10% 16WV, electrolytic
C321	1-101-007	0.05μF +100 −0% 50WV, ceramic
C322		– discarded –
C323	1-101-007	0.05μF +100 −0% 50WV, ceramic
C324	1-102-888	150pF ± 5% 50WV, ceramic

Ref.No.	Part No.	Description
C325		– discarded –
C326	1-101-007	0.05μF +100 −0% 50WV, ceramic
C327	1-101-198	4pF ±0.25pF 50WV, ceramic
C328	1-101-007	0.05μF +100 −0% 50WV, ceramic
C329	1-102-765	120pF ± 5% 50WV, ceramic
C330	1-101-953	3pF ±0.5pF 25WV, ceramic
C331	1-101-007	0.05μF +100 −0% 50WV, ceramic
C332	1-121-395	4.7μF +150 −10% 25WV, electrolytic
C333	1-101-880	47pF ± 5% 50WV, ceramic
C334		– discarded –
C335	1-101-007	0.05μF +100 −0% 50WV, ceramic
C336	1-101-007	0.05μF +100 −0% 50WV, ceramic
C337	1-121-391	1μF +150 −10% 50WV, electrolytic
C338	1-101-888	68pF ± 5% 50WV, ceramic
C339		– discarded –
C340	1-101-865	22pF ± 5% 50WV, ceramic
★C341	1-101-880	47pF ± 5% 50WV, ceramic
C342	1-101-888	68pF ± 5% 50WV, ceramic
C343	1-102-886	82pF ± 5% 50WV, ceramic
C344	1-101-877	39pF ±10% 50WV, ceramic
C345	1-101-888	68pF ± 5% 50WV, ceramic
C346		– discarded –
C347		– discarded –
C348		– discarded –
C349		– discarded –
C350		– discarded –
C351	1-101-869	27pF ± 5% 50WV, ceramic
C352	1-101-869	27pF ± 5% 50WV, ceramic
C353	1-101-862	18pF ± 5% 50WV, ceramic
C354	1-101-862	18pF ± 5% 50WV, ceramic
C355	1-101-869	27pF ± 5% 50WV, ceramic
C356	1-101-869	27pF ± 5% 50WV, ceramic
C357	1-101-865	22pF ± 5% 50WV, ceramic
C358	1-101-865	22pF ± 5% 50WV, ceramic
C359	1-101-869	27pF ± 5% 50WV, ceramic
C360	1-101-869	27pF ± 5% 50WV, ceramic
C361	1-102-951	15pF ± 5% 50WV, ceramic
C362	1-102-951	15pF ± 5% 50WV, ceramic
C363	1-102-951	15pF ± 5% 50WV, ceramic
C364		– discarded –
C365		– discarded –
C366		– discarded –
C367		– discarded –
C368		– discarded –
C369		– discarded –
C370		– discarded –
C371		– discarded –
C372		– discarded –
C373	1-102-858	10pF ±0.5% 50WV, ceramic
C374		– discarded –
C375		– discarded –
C376		– discarded –
C377		– discarded –
C378		– discarded –
C379		– discarded –
C380		– discarded –
C381	1-121-391	1μF +150 −10% 50WV, electrolytic
C382	1-105-721-12	0.047μF ±10% 100WV, mylar
C383	1-101-896	100pF ± 5% 50WV, ceramic
C384	1-101-439	680pF ±20% 50WV, ceramic
C385	1-121-398	10μF +150 −10% 25WV, electrolytic
C386	1-121-410	47μF +100 −10% 25WV, electrolytic
C401	1-102-858	10pF ±0.5% 50WV, ceramic
C402	1-121-450	2.2μF +150 −10% 50WV, electrolytic
C403	1-121-726	0.47μF +150 −10% 50WV, electrolytic
C404	1-102-098	470pF ±20% 50WV, ceramic
C405	1-102-098	470pF ±20% 50WV, ceramic
C406	1-102-098	470pF ±20% 50WV, ceramic
C407	1-105-731	0.33μF ±10% 100WV, mylar
C408	1-101-439	680pF ±20% 50WV, ceramic
C409	1-105-731	0.33μF ±10% 100WV, mylar
C410	1-101-439	680pF ±20% 50WV, ceramic
C411	1-105-731-13	0.33μF ±10% 600WV, mylar
C412	1-101-439	680pF ±20% 50WV, ceramic
C413	1-101-823	0.01μF +100 −0% 500WV, ceramic
C414	1-102-858	10pF ±0.5% 50WV, ceramic
C415	1-121-726	0.47μF +150 −10% 50WV, electrolytic
C416	1-101-002	0.002μF +100 −0% 50WV, ceramic
C501	1-121-426	470μF +100 −10% 16WV, electrolytic
C502	1-121-398	10μF +100 −10% 25WV, electrolytic
C503	1-105-721-12	0.047μF ±10% 100WV, mylar
C504	1-105-721-12	0.047μF ±10% 100WV, mylar
C505	1-131-116	10μF ±20% 16WV, tantalum
C506	1-121-403	33μF +100 −10% 16WV, electrolytic
★C507	1-127-205	2μF ±20% 16WV, aluminum electrolytic
C508	1-105-719-12	0.033μF ±10% 100WV, mylar
C509	1-105-717-12	0.022μF ±10% 100WV, mylar
C510	1-105-721-12	0.047μF ±10% 100WV, mylar
C511	1-121-426	470μF +100 −10% 16WV, electrolytic
C512	1-121-391	1μF +150 −10% 50WV, electrolytic
C513	1-101-896	100pF ± 5% 50WV, ceramic
C514	1-105-717-12	0.022μF ±10% 100WV, mylar
C515	1-105-717-12	0.022μF ±10% 100WV, mylar
C516	1-121-391	1μF +150 −10% 50WV, electrolytic
C517	1-105-725-12	0.1μF ±10% 100WV, mylar
C518	1-121-395	4.7μF +150 −10% 25WV, electrolytic
C519	1-105-725-12	0.1μF ±10% 100WV, mylar
C520	1-121-395	4.7μF +150 −10% 25WV, electrolytic
C521	1-105-717-12	0.022μF ±10% 100WV, mylar
C522	1-105-721-12	0.047μF ±10% 100WV, mylar
※C523	1-105-725-12	0.0022μF ±10% 100WV, mylar
※C523	1-105-707-12	0.0033μF ±10% 100WV, mylar
C524	1-129-776	0.022μF ±5% 50WV, polypropylene
C525	1-105-713-12	0.01μF ±10% 100WV, mylar
C526	1-105-461-16	0.001μF ±10% 600WV, mylar

Note: ※ to be selected.

Ref.No.	Part No.	Description
C527	1-105-729-13	0.22μF ±10% 100WV, mylar
C528	1-105-729-13	0.22μF ±10% 100WV, mylar
★ C529	1-102-989-11	68pF ± 5%500WV, ceramic
★ C530	1-102-157	560pF ±10%500WV, ceramic
C601	1-102-069-11	0.0047μF $\pm^{100}_{10}$% 150WV, ceramic
C602	1-102-069-11	0.0047μF $\pm^{100}_{10}$% 150WV, ceramic
C603		– discarded –
C604		– discarded –
C605		– discarded –
C606	1-105-753-12	0.01μF ±10% 200WV, mylar
C607	1-105-765-12	0.1μF ±10% 200WV, mylar
C608	1-108-321-11	1.5μF ±10% 100WV, mylar
C609	1-108-320-11	0.33μF ±10% 100WV, mylar
C610		– discarded –
※C611	1-105-717-12	0.022μF ±10% 100WV, mylar
※C611	1-105-723-12	0.068μF ±10% 100WV, mylar
※C611	1-105-725-12	0.1μF ±10% 100WV, mylar
C612	1-121-422	220μF $\pm^{100}_{0}$% 25WV, electrolytic
C613	1-121-747	4.7μF $\pm^{150}_{0}$% 25WV, electrolytic
C614	1-105-481-16	0.001μF ±20% 600WV, mylar
C615	1-121-248	1,000μF $\pm^{100}_{10}$% 6.3WV, electrolytic
★ C616	1-102-157	560pF ±10%500WV, ceramic
C651	1-519-030-00	1kV spark gap
C652	1-119-242	1μF $\pm^{150}_{10}$% 500WV, electrolytic
C653	1-519-030-00	1kV spark gap
C701	1-121-397	10μF $\pm^{100}_{10}$% 16WV, electrolytic
C702	1-121-413	100μF $\pm^{100}_{10}$% 6.3WV, electrolytic
C703	1-121-416	100μF $\pm^{100}_{10}$% 25WV, electrolytic
C704	1-121-415	100μF $\pm^{100}_{10}$% 16WV, electrolytic
C705	1-121-189	1μF $\pm^{150}_{10}$% 16WV, electrolytic
C706	1-105-681-12	0.047μF ±10% 50WV, mylar
C707	1-101-810	100pF ± 5% 500WV, ceramic
C708	1-105-681-12	0.047μF ±10% 50WV, mylar
★ C801	1-105-471-13	0.047μF ±10% 600WV, mylar
★ C802	1-102-088	1,000pF $\pm^{100}_{0}$% 25kWV, ceramic
C803		– discarded –
C804		– discarded –
C805	1-108-318-11	0.01μF ±10% 1kWV, mylar
C806	1-119-244	47μF $\pm^{100}_{10}$% 160WV, electrolytic
★ C807	1-119-245	30μF ±20% 160WV, electrolytic
★ C808	1-119-247	10μF ±20% 160WV, electrolytic
C809	1-119-273	220μF $\pm^{150}_{10}$% 25WV, electrolytic
C810	1-129-778-11	0.017μF ± 5% 1kWV, mylar
C811		– discarded –
C812	1-129-777-11	0.012μF ± 5% 1kWV, mylar
C813		– discarded –
C814, C815	1-102-087	47pF ±10% 1.5kWV, ceramic
C816	1-519-030	1kV gap spark
C817	1-119-243	20μF $\pm^{100}_{10}$% 350WV, electrolytic
★ C818	1-101-845	0.001μF $\pm^{100}_{0}$% 500WV, ceramic
C819	1-101-845	0.001μF $\pm^{100}_{0}$% 500WV, ceramic
C820	1-102-095	330pF ±20% 1kWV, ceramic
C821	1-102-095	330pF ±20% 1kWV, ceramic
C822	1-102-095	330pF ±20% 1kWV, ceramic
C823	1-102-095	330pF ±20% 1kWV, ceramic
C824	1-105-753-12	0.01μF ±10%200WV, mylar
★ C825	1-119-246	5μF ±20%160WV, electrolytic
C851	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C852	1-101-861	15pF ± 5% 50WV, ceramic
C853	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C854	1-101-861	15pF ± 5% 50WV, ceramic
C855	1-101-837	0.5pF ±0.2p 50WV, ceramic
C856	1-102-689	16pF ±0.5p 50WV, ceramic
C857		– discarded –
C858	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C859	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C860	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C861	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C862	1-102-093	470pF ±20% 50WV, ceramic
C863	1-121-456	3.3μF $\pm^{150}_{10}$% 25WV, electrolytic
C864	1-101-900	30pF ±10% 50WV, ceramic
C865	1-121-395	4.7μF $\pm^{150}_{10}$% 25WV, electrolytic
C866		– discarded –
C867	1-121-398	10μF $\pm^{150}_{10}$% 25WV, electrolytic
C868	1-101-900	30pF ±10% 50WV, ceramic
C869	1-102-149	0.001μF $\pm^{100}_{0}$%150WV, ceramic
C870	1-101-900	30pF ±10% 50WV, ceramic
C871	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C881	1-121-391	1μF $\pm^{150}_{0}$% 50WV, electrolytic
C882	1-121-472	10μF $\pm^{100}_{0}$% 25WV, electrolytic
C883	1-101-007	0.05μF $\pm^{100}_{0}$% 50WV, ceramic
C884	1-101-004	0.01μF $\pm^{100}_{0}$% 50WV, ceramic
C885	1-102-963	100pF ±10% 50WV, ceramic
C886	1-102-983	220pF ±10% 50WV, ceramic
C887	1-101-002	0.002μF $\pm^{100}_{0}$% 50WV, ceramic
C901	1-115-086	0.1μF ±20%600WV, oil tubular
C902	1-125-064	470+10+220μF $\pm^{100}_{10}$% 160WV, electrolytic
★ C903	1-108-318-11	0.01μF ±10% 1kWV, mylar
★ C904	1-105-719-12	0.033μF±10%100WV, mylar
C905	1-105-913-13	0.01μF ±20%200WV, mylar
C906	1-102-149	0.0022μF $\pm^{100}_{0}$% 150VAC, ceramic
CR201	1-101-536	500pF x 2, 3,300Ω x 2, component CR
★ CV201	1-141-092	1 ~ 5P 25WV, cylinder trimmer
	1-141-136	1 ~ 5P 50WV, cylinder trimmer

RESISTORS

R201	1-248-703	18kΩ ± 5% ERD14V, carbon
R202	1-206-126	390Ω ±10% 2W, metallic oxide
R203	1-248-641	47Ω ± 5% ERD14V, carbon
R204	1-248-637	33Ω ±10% ERD14V, carbon
R205	1-248-660	300Ω ± 5% ERD14V, carbon
R206	1-248-685	3,300Ω ± 5% ERD14V, carbon
R207	1-246-673	1kΩ ± 5% ERD14T, carbon
R208		– discarded –

Note: ※ to be selected.

Ref.No.	Part No.	Description
R209	1-248-666	510Ω ± 5% ERD14V, carbon
R210	1-248-685	3,300Ω ± 5% ERD14V, carbon
R211	1-248-653	150Ω ± 5% ERD14V, carbon
R212	1-206-125	82Ω ±10% 2W, metallic oxide
R213		– discarded –
R214	1-248-689	4,700Ω ± 5% ERD14V, carbon
R215	1-248-679	1,800Ω ± 5% ERD14V, carbon
R216	1-248-667	560Ω ± 5% ERD14V, carbon
R217	1-248-657	220Ω ± 5% ERD14V, carbon
R218		– discarded –
R219	1-248-695	8,200Ω ± 5% ERD14V, carbon
R220	1-248-675	1,200Ω ± 5% ERD14V, carbon
R221	1-248-669	680Ω ± 5% ERD14V, carbon
R222	1-248-691	5,600Ω ± 5% ERD14V, carbon
R223	1-248-699	12kΩ ± 5% ERD14V, carbon
R224	1-248-649	100Ω ± 5% ERD14V, carbon
R225	1-248-671	820Ω ± 5% ERD14V, carbon
R226	1-248-677	1,500Ω ± 5% ERD14V, carbon
R227	1-248-653	150Ω ± 5% ERD14V, carbon
R228	1-248-677	1,500Ω ± 5% ERD14V, carbon
R229		– discarded –
R230	1-248-643	56Ω ± 5% ERD14V, carbon
R231	1-248-671	820Ω ± 5% ERD14V, carbon
R232	1-248-661	330Ω ± 5% ERD14V, carbon
R233	1-248-657	220Ω ± 5% ERD14V, carbon
R234	1-248-687	3,900Ω ± 5% ERD14V, carbon
R235	1-248-691	5,600Ω ± 5% ERD14V, carbon
R236	1-248-672	910Ω ± 5% ERD14V, carbon
R237	1-248-667	560Ω ± 5% ERD14V, carbon
R238	1-248-677	1,500Ω ±10% ERD14V, carbon
R239	1-248-701	15kΩ ± 5% ERD14V, carbon
R240	1-248-689	4,700Ω ± 5% ERD14V, carbon
R241	1-248-649	100Ω ±10% ERD14V, carbon
R242	1-248-643	56Ω ± 5% ERD14V, carbon
R243	1-248-697	10kΩ ±10% ERD14V, carbon
R244	1-248-673	1kΩ ±10% ERD14V, carbon
R245	1-248-649	100Ω ±10% ERD14V, carbon
R246	1-246-705	22kΩ ±10% ERD14T, carbon
R247	1-248-687	3,900Ω ± 5% ERD14V, carbon
R248	1-248-697	10kΩ ±10% ERD14V, carbon
R249	1-248-705	22kΩ ± 5% ERD14V, carbon
R250	1-248-697	10kΩ ± 5% ERD14V, carbon
R251	1-248-689	4,700Ω ± 5% ERD14V, carbon
R252	1-248-681	2,200Ω ± 5% ERD14V, carbon
R253	1-248-673	1kΩ ± 5% ERD14V, carbon
R254	1-248-691	5,600Ω ±10% ERD14V, carbon
R255	1-248-683	2,700Ω ± 5% ERD14V, carbon
R256	1-248-685	3,300Ω ± 5% ERD14V, carbon
R257	1-248-673	1kΩ ± 5% ERD14V, carbon
R258	1-248-699	12kΩ ± 5% ERD14V, carbon
R259	1-248-681	2,200Ω ± 5% ERD14V, carbon
R260	1-248-661	330Ω ± 5% ERD14V, carbon
R261	1-248-691	5,600Ω ± 5% ERD14V, carbon
R262		– discarded –

Ref.No.	Part No.	Description
R263	1-248-665	470Ω ± 5% ERD14V, carbon
R264	1-248-675	1,200Ω ± 5% ERD14V, carbon
R265	1-248-677	1,500Ω ± 5% ERD14V, carbon
R266		– discarded –
R267		– discarded –
R268	1-248-713	47kΩ ±10% ERD14V, carbon
R269	1-248-663	390Ω ±10% ERD14V, carbon
R270	1-248-651	120Ω ±10% ERD14V, carbon
R271	1-248-671	820Ω ± 5% ERD14V, carbon
R272	1-248-645	68Ω ± 5% ERD14V, carbon
R273	1-248-649	100Ω ± 5% ERD14V, carbon
R274	1-248-624	9.1Ω ± 5% ERD14V, carbon
R275	1-248-649	100Ω ± 5% ERD14V, carbon
R276	1-246-677	1,500Ω ± 5% ERD14T, carbon
R277	1-250-855-	180Ω ± 5% ERD12T, carbon
R278	1-248-709	33kΩ ± 5% ERD14V, carbon
R301	1-246-677	1,500Ω ± 5% ERD14T, carbon
R302	1-246-695	8,200Ω ± 5% ERD14T, carbon
R303	1-246-685	3,300Ω ± 5% ERD14T, carbon
R304	1-246-655	180Ω ± 5% ERD14T, carbon
R305	1-246-669	680Ω ± 5% ERD14T, carbon
R306	1-246-669	680Ω ± 5% ERD14T, carbon
R307	1-246-653	150Ω ± 5% ERD14T, carbon
R308	1-246-673	1kΩ ± 5% ERD14T, carbon
R309	1-246-649	100Ω ± 5% ERD14T, carbon
★R310	1-246-681	2,200Ω ± 5% ERD14T, carbon
R311	1-246-701	15kΩ ± 5% ERD14T, carbon
R312	1-246-715	56kΩ ± 5% ERD14T, carbon
R313	1-246-695	8,200Ω ± 5% ERD14T, carbon
R314	1-246-681	2,200Ω ± 5% ERD14T, carbon
R315	1-246-649	100Ω ± 5% ERD14T, carbon
R316	1-246-675	1.2kΩ ± 5% ERD14T, carbon
R317	1-246-677	1,500Ω ± 5% ERD14T, carbon
R318	1-246-701	15kΩ ± 5% ERD14T, carbon
R319	1-246-671	820Ω ± 5% ERD14T, carbon
R320	1-246-713	47kΩ ± 5% ERD14T, carbon
R321	1-246-707	27kΩ ± 5% ERD14T, carbon
R322	1-246-683	2,700Ω ± 5% ERD14T, carbon
R323	1-246-661	330Ω ± 5% ERD14T, carbon
R324	1-246-625	10Ω ± 5% ERD14T, carbon
R325	1-246-671	820Ω ± 5% ERD14T, carbon
R326	1-246-655	180Ω ± 5% ERD14T, carbon
R327	1-246-651	120Ω ± 5% ERD14T, carbon
R328	1-246-655	180Ω ± 5% ERD14T, carbon
R329	1-246-675	1,200Ω ± 5% ERD14T, carbon
★R330	1-246-685	3,300Ω ± 5% ERD14T, carbon
R331	1-246-697	10kΩ ± 5% ERD14T, carbon
R332	1-246-681	2,200Ω ± 5% ERD14T, carbon
R333	1-246-659	270Ω ± 5% ERD14T, carbon
R334	1-246-661	330Ω ± 5% ERD14T, carbon
R335		– discarded –
R336	1-246-653	150Ω ± 5% ERD14T, carbon
R337	1-246-685	3,300Ω ± 5% ERD14T, carbon

Ref.No.	Part No.	Description
R338	1-246-701	15kΩ ± 5% ERD14T, carbon
R339	1-246-675	1,200Ω ± 5% ERD14T, carbon
R340	1-246-661	330Ω ± 5% ERD14T, carbon
R341	1-246-625	10Ω ± 5% ERD14T, carbon
R342	1-246-685	3,300Ω ± 5% ERD14T, carbon
R343	1-246-901	15kΩ ± 5% ERD14T, carbon
R344	1-246-653	150Ω ± 5% ERD14T, carbon
R345	1-246-661	330Ω ± 5% ERD14T, carbon
R346	1-246-625	10Ω ± 5% ERD14T, carbon
R347	1-246-675	1,200Ω ± 5% ERD14T, carbon
R348	1-246-681	2,200Ω ± 5% ERD14T, carbon
*R349	1-246-713	47kΩ ± 5% ERD14T, carbon
R350		– discarded –
R351	1-246-647	82Ω ± 5% ERD14T, carbon
R352		– discarded –
R353		– discarded –
R354		– discarded –
R355		– discarded –
R356		– discarded –
R357	1-246-681	2,200Ω ± 5% ERD14T, carbon
R358	1-246-709	33kΩ ± 5% ERD14T, carbon
R359	1-246-733	330kΩ ± 5% ERD14T, carbon
R360	1-246-697	10kΩ ± 5% ERD14T, carbon
R361	1-246-693	6,800Ω ± 5% ERD14T, carbon
R362	1-246-681	2,200Ω ± 5% ERD14T, carbon
R363	1-246-693	6,800Ω ± 5% ERD14T, carbon
R364	1-246-673	1kΩ ± 5% ERD14T, carbon
R365	1-246-673	1kΩ ± 5% ERD14T, carbon
R366	1-246-693	6,800Ω ± 5% ERD14T, carbon
R367	1-246-693	6,800Ω ± 5% ERD14T, carbon
R368	1-246-677	1,500Ω ± 5% ERD14T, carbon
R369	1-246-677	1,500Ω ± 5% ERD14T, carbon
R370	1-246-673	1kΩ ± 5% ERD14T, carbon
R371	1-246-673	1kΩ ± 5% ERD14T, carbon
R372	1-246-693	6,800Ω ± 5% ERD14T, carbon
R373	1-246-693	6,800Ω ± 5% ERD14T, carbon
R374	1-246-687	3,900Ω ± 5% ERD14T, carbon
R375	1-246-687	3,900Ω ± 5% ERD14T, carbon
R376	1-246-673	1kΩ ± 5% ERD14T, carbon
R377	1-246-673	1kΩ ± 5% ERD14T, carbon
R378	1-246-693	6,800Ω ± 5% ERD14T, carbon
R379	1-246-693	6,800Ω ± 5% ERD14T, carbon
R380	1-246-641	47Ω ± 5% ERD14T, carbon
R381	1-246-653	150Ω ± 5% ERD14T, carbon
R382	1-246-683	2,700Ω ± 5% ERD14T, carbon
R401	1-246-667	560Ω ± 5% ERD14T, carbon
R402	1-246-669	680Ω ± 5% ERD14T, carbon
R403	1-246-679	1,800Ω ± 5% ERD14T, carbon
R404	1-246-681	2,200Ω ± 5% ERD14T, carbon
R405	1-246-687	3,900Ω ± 5% ERD14T, carbon
R406	1-246-697	10kΩ ± 5% ERD14T, carbon
R407	1-246-669	680Ω ± 5% ERD14T, carbon
R408	1-246-709	33kΩ ± 5% ERD14T, carbon
R409	1-246-717	68kΩ ± 5% ERD14T, carbon
R410	1-246-713	47kΩ ± 5% ERD14T, carbon
R411		– discarded –
R412	1-246-713	47kΩ ± 5% ERD14T, carbon
R413	1-246-705	22kΩ ± 5% ERD14T, carbon
R414	1-246-707	27kΩ ± 5% ERD14T, carbon
R415	1-246-665	470Ω ± 5% ERD14T, carbon
R416	1-246-653	150Ω ± 5% ERD14T, carbon
R417	1-246-675	1,200Ω ± 5% ERD14T, carbon
R418	1-250-871	820Ω ± 5% ERD12T, carbon
R419	1-246-661	330Ω ± 5% ERD14T, carbon
R420	1-206-104	10kΩ ±10% 1W, metallic oxide
R421	1-246-659	270Ω ± 5% ERD14T, carbon
R422	1-246-641	47Ω ± 5% ERD14T, carbon
R423	1-246-709	33kΩ ± 5% ERD14T, carbon
R424	1-246-723	120kΩ ± 5% ERD14T, carbon
R425	1-206-104	10kΩ ±10% 1W, metallic oxide
R426	1-246-659	270Ω ± 5% ERD14T, carbon
R427	1-246-641	47Ω ± 5% ERD14T, carbon
R428	1-246-709	33kΩ ± 5% ERD14T, carbon
R429	1-246-723	1,200Ω ± 5% ERD14T, carbon
R430	1-206-104	10kΩ ±10% 1W, metallic oxide
R431	1-246-659	270Ω ± 5% ERD14T, carbon
R432	1-246-641	47Ω ± 5% ERD14T, carbon
R433	1-246-709	33kΩ ± 5% ERD14T, carbon
R434	1-246-723	120kΩ ± 5% ERD14T, carbon
R435	1-246-657	220Ω ± 5% ERD14T, carbon
R501	1-246-705	22kΩ ± 5% ERD14T, carbon
*R502	1-246-697	10kΩ ± 5% ERD14T, carbon
*R503	1-246-707	27kΩ ± 5% ERD14T, carbon
R504	1-246-637	33Ω ± 5% ERD14T, carbon
R505	1-246-685	3,300Ω ± 5% ERD14T, carbon
R506	1-246-625	10Ω ± 5% ERD14T, carbon
R507	1-246-679	1,800Ω ± 5% ERD14T, carbon
R508	1-246-681	2,200Ω ± 5% ERD14T, carbon
R509	1-246-689	4,700Ω ± 5% ERD14T, carbon
R510	1-246-677	1,500Ω ± 5% ERD14T, carbon
R511	1-246-689	4,700Ω ± 5% ERD14T, carbon
R512	1-246-673	1kΩ ± 5% ERD14T, carbon
R513	1-246-633	22Ω ± 5% ERD14T, carbon
R514	1-207-185	1Ω ± 5% ½W, wire wound
R515	1-250-909	33kΩ ±10% ERD12T, carbon
R516	1-246-707	27kΩ ±10% ERD14T, carbon
R517	1-246-695	8,200Ω ±10% ERD14T, carbon
R518	1-211-090	27kΩ ± 5% RD1P, carbon
R519	1-205-455	100Ω ±10% 3W, cement coated
R520	1-246-701	15kΩ ± 5% ERD14T, carbon
R521	1-246-665	470Ω ± 5% ERD14T, carbon
R522	1-246-665	470Ω ± 5% ERD14T, carbon
R523	1-246-659	270Ω ± 5% ERD14T, carbon
R524	1-246-725	150kΩ ± 5% ERD14T, carbon
R525	1-246-687	3,900Ω ± 5% ERD14T, carbon
R526	1-246-687	3,900Ω ± 5% ERD14T, carbon

Ref.No.	Part No.	Description
R527	1-246-703	18kΩ ± 5% ERD14T, carbon
R528		– discarded –
R529		– discarded –
R530	1-246-672	910Ω ± 5% ERD14T, carbon
R531	1-246-687	3,900Ω ± 5% ERD14T, carbon
R532	1-246-673	1kΩ ± 5% ERD14T, carbon
R533	1-246-673	1kΩ ± 5% ERD14T, carbon
R534	1-246-667	560Ω ± 5% ERD14T, carbon
R535	1-246-665	470Ω ± 5% ERD14T, carbon
R536	1-246-667	560Ω ± 5% ERD14T, carbon
R537	1-246-677	1,500Ω ± 5% ERD14T, carbon
R538	1-206-132	8,200Ω ±10% 2W, metallic oxide
R539		– discarded –
*R540, R541	1-207-288	27Ω ±10% 1.5W, wire wound
*R540, R541	1-207-290	33Ω ±10% 1.5W, wire wound
*R540, R541	1-207-293	43Ω ±10% 1.5W, wire wound
R542	1-246-667	560Ω ± 5% ERD14T, carbon
R543	1-246-697	10kΩ ± 5% ERD14T, carbon
R544	1-246-707	27kΩ ± 5% ERD14T, carbon
R545	1-250-825	10Ω ± 5% ERD12T, carbon
R546	1-246-665	470Ω ± 5% ERD14T, carbon
R547	1-206-130	1,500Ω ±10% 2W, metallic oxide
R548	1-250-897	10kΩ ± 5% ERD12T, carbon
R549	1-246-689	4,700Ω ± 5% ERD14T, carbon
R601	1-205-465	2,700Ω ±10% 7W, cement coated
R602	1-250-913	47kΩ ±10% ERD12T, carbon
R603	1-250-915	56kΩ ±10% ERD12T, carbon
R604	1-206-049	10kΩ ±10% 3W, metallic oxide
R605	1-246-677	560Ω ± 5% ERD14T, carbon
R606	1-246-685	3,300Ω ± 5% ERD14T, carbon
R607		– discarded –
R608	1-246-709	33kΩ ± 5% ERD14T, carbon
R609	1-246-735	390kΩ ± 5% ERD14T, carbon
R610		– discarded –
R611	1-207-241	5Ω ±10% 0.65A, wire wound
R612	1-207-241	5Ω ±10% 0.65A, wire wound
R613	1-205-456	390Ω ±10% 3W, cement coated
R614		– discarded –
R615	1-206-069	10Ω ±10% 1W, metallic oxide
R616	1-246-665	470Ω ± 5% ERD14T, carbon
R617		– discarded –
R618	1-250-817	4.7Ω ±10% ERD12T, carbon
R619	1-202-513	3.3Ω ± 5% RC½, composition
*R620	1-244-625	10Ω ± 5% RD¼H, carbon
R651	1-202-629	220kΩ ±20% RC½, composition
*R652	1-202-808	470kΩ ±20% RC1, composition
*R652	1-202-806	330kΩ ±20% RC1, composition
*R652	1-202-804	220kΩ ±20% RC1, composition
*R652	1-202-802	150kΩ ±20% RC1, composition
R653	1-202-780	2,200Ω ±20% RC1, composition
	1-202-778	1,500Ω ±20% RC1, composition
R654	1-202-780	2,200Ω ±20% RC1, composition
	1-202-778	1,500Ω ±20% RC1, composition
*R655	1-202-808	470kΩ ±20% RC1, composition
*R655	1-202-806	330kΩ ±20% RC1, composition
*R655	1-202-804	220kΩ ±20% RC1, composition
*R655	1-202-802	150kΩ ±20% RC1, composition
R656	1-202-780	2,200Ω ±20% RC1, composition
	1-202-778	1,500Ω ±20% RC1, composition
R657	1-202-585	3,300Ω ±20% RC½, composition
R701	1-248-717	68kΩ ±10% ERD14V, carbon
R702	1-248-705	22kΩ ±10% ERD14V, carbon
R703	1-248-665	470Ω ±10% ERD14V, carbon
R704	1-248-671	820Ω ±10% ERD14V, carbon
R705	1-248-627	12Ω ± 5% ERD14V, carbon
R706	1-248-673	1kΩ ±10% ERD14V, carbon
R707	1-205-456	390Ω ±10% 7W, cement coated
R708	1-248-709	33kΩ ± 5% ERD14V, carbon
R709	1-248-705	22kΩ ±10% ERD14V, carbon
R801	1-250-895	8,200Ω ±10% ERD12T, carbon
R802	1-202-631	270kΩ ±10% RC½, composition
*R803	1-202-579	1,800Ω ±10% RC½, composition
R804	1-207-249	1.8Ω ± 5% 1W, wire wound
R805		– discarded –
R806	1-205-459	82Ω ±10% 7W, cement coated
R807	1-205-460	150Ω ±10% 7W, cement coated
R808		– discarded –
R809		– discarded –
R810		– discarded –
R811		– discarded –
R812		– discarded –
*R813	1-202-776	1kΩ ±20% RC1, composition
*R813	1-202-774	680Ω ±20% RC1, composition
*R813	1-202-778	1,500Ω ±20% RC1, composition
R814	1-202-631	270kΩ ±10% RC½, composition
R815		– discarded –
R816	1-250-895	8,200Ω ± 5% ERD12T, carbon
R851	1-248-649	100Ω ± 5% ERD14V, carbon
R852	1-248-701	15kΩ ± 5% ERD14V, carbon
R853	1-248-669	680Ω ± 5% ERD14V, carbon
R854	1-248-667	560Ω ± 5% ERD14V, carbon
R855	1-248-703	18kΩ ± 5% ERD14V, carbon
R856	1-248-649	100Ω ± 5% ERD14V, carbon
R857	1-248-657	220Ω ± 5% ERD14V, carbon
R858	1-248-677	1,500Ω ± 5% ERD14V, carbon
R859	1-248-690	5,100Ω ± 5% ERD14V, carbon
R860	1-202-471	4.7MΩ ±10% RC¼, composition
R861	1-248-685	300Ω ± 5% ERD14V, carbon
R862	1-248-705	22kΩ ± 5% ERD14V, carbon
R863	1-248-679	1,800Ω ± 5% ERD14V, carbon
R864	1-248-681	2,200Ω ± 5% ERD14V, carbon
R865	1-248-701	15kΩ ± 5% ERD14V, carbon
R866	1-248-705	22kΩ ± 5% ERD14V, carbon

Note: * to be selected.

Ref.No.	Part No.	Description
	1-536-047	terminal strip, E type
	1-536-153	terminal strip, 3L2
	1-536-171	terminal plate, L7L
	1-536-220	terminal strip, 6P
	1-536-221	terminal strip, 3P
	1-536-243	terminal, ac input
	1-536-269	terminal plate, antenna
★ F801	1-532-209	fuse, 1.6A
	added (Serial No. 30,001 and later)	
SR901	1-800-031	varistor
SR902	1-800-032	varistor TD-80
★ PR901	1-800-051	thermistor (positive)
CRT	8-735-300-00	picture tube (330AB22)

Ref.No.	Part No.	Description
★ PR901	1-800-065	thermistor (positive)
	changed (Serial No. 30,001 and later)	
	8-983-106-15	VHF tuner ass'y (BT602WU)
	8-983-106-45	signal circuit board (S), complete
	8-983-106-25	chroma-deflection circuit board (CD), complete
	8-983-104-35	power supply circuit board (P), complete
	8-980-141-55	socket circuit board (T), complete
	8-980-141-15	audio circuit board (A), complete
	1-463-011-00	UHF tuner ass'y
	8-983-106-85	touch-indication circuit board (TI), complete

Ref.No.	Part No.	Description
	COILS	
★ L905, ★ L906	1-451-070	deflection yoke
	changed (Serial No. 38,001 and later)	
★ L908	discarded (Serial No. 38,001 and later)	
	TRANSFORMERS	
★ T901	1-427-300	transformer, vertical output
	changed (Serial No. 30,001 and later)	
★ T905	discarded (Serial No. 38,001 and later)	
	CAPACITORS	
★ C270	1-102-112	330pF ±10% 50WV, ceramic
	changed (Serial No. 26,001 and later)	
★ C341	1-102-874	36pF ± 5% 50WV, ceramic
	changed (Serial No. 24,001 and later)	
★ C507	1-127-024	2.2μF ±20% 16WV, aluminum
	changed (Serial No. 11,501 and later)	electrolytic
★ C529	discarded (Serial No. 26,001 and later)	
★ C530	added (Serial No. 26,001 and later)	
★ C616	added (Serial No. 30,001 and later)	
★ C801	1-105-467-13	0.01μF ±10% 600WV, mylar
	changed (Serial No. 32,301 and later)	
★ C802	1-102-146	250pF $\pm^{100}_{0}$% 25kV, ceramic
	changed (Serial No. 32,301 and later)	
★ C807	1-119-310	40μF ±20% 160V, electrolytic
	changed (Serial No. 30,001 and later)	

Ref.No.	Part No.	Description
★ C808	discarded (Serial No. 30,001 and later)	
★ C818	discarded (Serial No. 24,001 and later)	
★ C825	added (Serial No. 30,001 and later)	
★ C903	discarded (Serial No. 30,001 and later)	
★ C904	discarded (Serial No. 38,001 and later)	
★ CV201	changed (Serial No. 34,001 and later)	
	RESISTORS	
★ R310, ★ R330	1-244-687	3.9kΩ ± 5% RD¼W, carbon
	changed (Serial No. 30,001 and later)	
★ R349	1-244-709	33kΩ ± 5% RD¼H, carbon
	changed (Serial No. 24,001 and later)	
★ R502	1-244-699	12kΩ ± 5% RD¼H, carbon
	changed (Serial No. 30,001 and later)	
★ R503	1-244-705	22kΩ ± 5% RD¼H, carbon
	changed (Serial No. 30,001 and later)	
★ R620	added (Serial No. 30,001 and later)	
★ R803	1-202-575	1.2kΩ ±10% RC½, composition
	changed (Serial No. 32,301 and later)	
★ R910	1-203-319-21	22kΩ
	changed (Serial No. 30,001 and later)	
★ R917	discarded (Serial No. 38,001 and later)	
★ R921	discarded (Serial No. 30,001 and later)	
★ VR407	discarded (Serial No. 26,001 and later)	

When ordering replacement parts, you should use PART NUMBER listed on the Complete Spare Parts List or shown in the Exploded View. The symbol number should not be used for ordering purposes.

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